九齊科技股份有限公司
Nyquest Technology Co., Ltd.

User Manual

Q-MIDI for NY7 Series

8-ch MIDI Timbre Editor

Version 2.2
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Revision History

Version	Date	Description	Modified Page
1.0	2013/8/31	Formal release.	-
1.1	2013/11/27	1. Modify *Q-MIDI* UI. 2. Add the descriptions of Output Folder function. 3. Add Setting selection and Project Setting functions. 4. Add Chip Series selection. 5. Add Voice Output selection. 6. Add Dynamic Allocation function. 7. Modify the maximum parameter of Fade Out Tick as 15. 8. Add Music and its descriptions. 9. Modify NY7 Converting Rules. 10. Modify NY7 Flowchart.	- 9 11, 25 11 11 12 13 14, 31 50 53
1.2	2014/2/28	1. Remove the Envelope Editing Zone. 2. Remove the settings of long and short timbre. 3. Modify *Q-MIDI* UI. 4. Add the descriptions of the “Convert to MD3” function. 5. Modify the descriptions of WavEditor function. 6. Modify the descriptions of EnvelopeEditor function. 7. Modify the items of Synthesize Option. 8. Modify the descriptions of Summary. 9. Modify the output file of Convert function as .md3 file. 10. Add operations of editing Tail section. 11. Add operations of EnvelopeEditor function. 12. Modify the definitions of Compile. 13. Add the file description of .md3 to appendix. 14. Modify NY7 Flowchart.	- 8 10 17 19 21 23 25 37 38 42 50 53
1.3	2014/5/21	1. Modify the WavEditor interface. 2. Add new functions to WavEditor. 3. Modify the EnvelopeEditor interface. 4. Modify Synthesize Option. 5. Add Piano Bar. 6. Modify EnvelopeEditor icons and options of Import/Export. 7. Add the descriptions of Build Information and ROM size Information. 8. Add the file description of .en1 and en2 to appendix.	17 17 19 21 22 38, 43 45 50

Version	Date	Description	Modified Page
1.4	2014/8/12	Modify *Q-MIDI* feature summary.	50
2.0	2015/2/28	Update UI and provide the easy and quick operations for users to improve the sound quality and efficiency.	-
2.1	2015/5/25	1. Add Dynamic Allocation Function of Convert Settings. 2. Add information of instruments in mid file to Project Manager. 3. Add the Auto Range Function to Instrument Manager. 4. Add Loop Function to Wav Editor. 5. Add Vibrato and Vibrato Settings Function to Synthesize Editor. 6. Adjust percussion name.	11 14 15 21 32 63
2.2	2015/8/21	1. Add Merge IDB function. 2. Modify Voice Output of Convert Settings. When NY7A series is selected, the Voice Output will be DAC, PMW or PWM+DAC mode. 3. Add Total Rom Size Table to Build Information. The unit of ROM size is Word, and the unit of Time length is Second.	8, 10 11 53

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1 Introduction

Q-MIDI is a tool for melody application development provided by Nyquest Technology Corporation limited (Nyquest). The main function of *Q-MIDI* focuses on timbre development for NY7 series microprocessor. *Q-MIDI* equips highly integrated user interface, user can create own exclusive instrument database. Through the simplified user interface and efficient development process, users can edit projects and convert MIDI files quickly and efficiently.

1.1 What is *Q-MIDI*

Q-MIDI is an integrated timbre development tool for melody application. It includes functionality of timbre and envelope editor, automatic timbre analyzer, and real-time timbre simulator. User can edit envelope, synthesize timbre with envelope, and eventually create customized Instrument Database (.idb2) easily. Besides, *Q-MIDI* also provides functions of simulating timbre on PC and converting .mid files to IC specified format.

1.2 Install *Q-MIDI*

Please contact Nyquest Technology to acquire the latest version of *Q-MIDI*. To install, simply unzip the .zip file and double click the .exe file. Then, follow the instruction of the Installation Wizard to complete the installation.

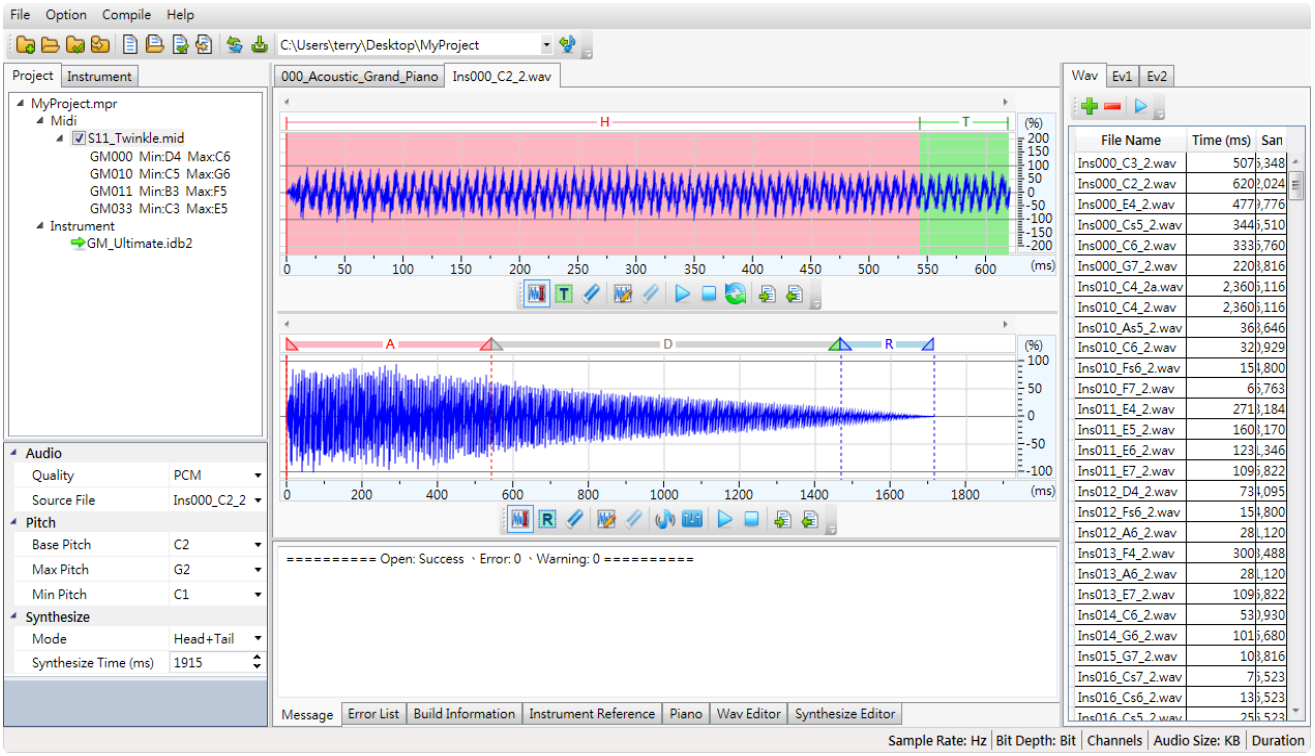
System Requirements:

- A PC compiled with Pentium 1.3GHz or higher CPU, Windows XP/ 7/ 8.
- At least 1G SDRAM.
- At least 2G free space on the hard disk.
- A display card and monitor that support 1366x768 resolution or higher.
- .NET Framework 4.0 installed.

2 Q-MIDI Interface

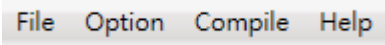
User can easily New Project or Open Project via clicking the corresponding buttons on the main page of *Q-MIDI.*

The screen of *Q-MIDI* contains: Menu, Toolbar, Project Manager, Instrument Manage, Subpatch Property Window, Instrument Table, Subpatch Editor, Information Window, Wav Manager and Envelope Manager. The following chapters will introduce every function respectively.

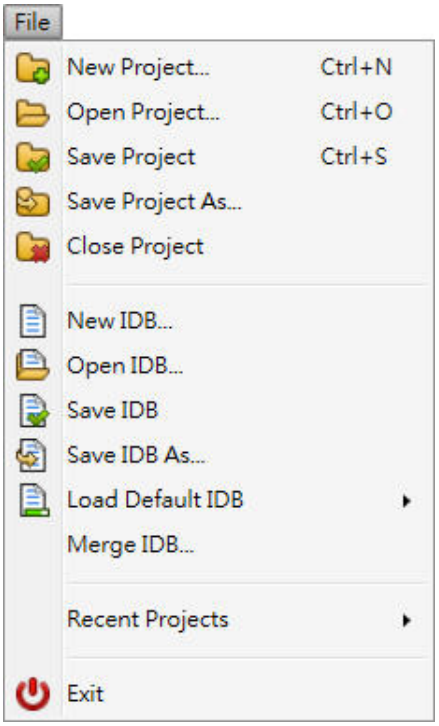


2.1 Menu

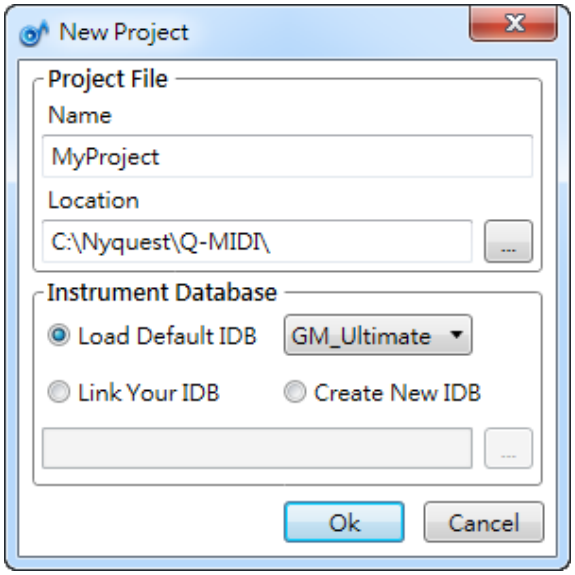
The menu bar contains: File, Option, Compile and Help.



2.1.1 File



New Project...: When creating a new project, user can create a project using a default or specified Instrument Database (shorten as IDB). A *Q-Midi* project's file extension is .mpr. The New Project window is shown as below.



- **Name:** Project Name.
- **Location:** The file path of projects.
- **Create New IDB:** Create a new instrument database.
- **Load Default IDB:** Load the built-in default instrument databases: GM_Ultimate, GM_Vintage and GM_LE. Please refer to the corresponding documentation in the installation directory for a detailed summary of these IDB content.
- **Link Your IDB:** To specify the desired instrument database.

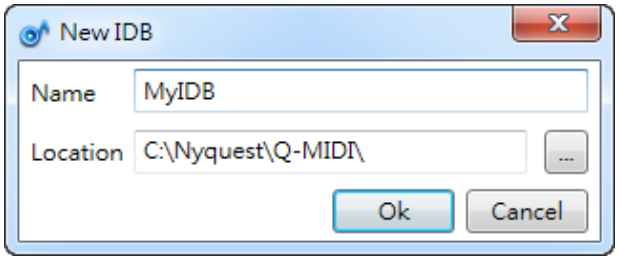
Open Project...: Open previously edited project file, the filename extension is .mpr.

Save Project: Save the current editing project file.

Save Project As...: Save the current project to the specified file path.

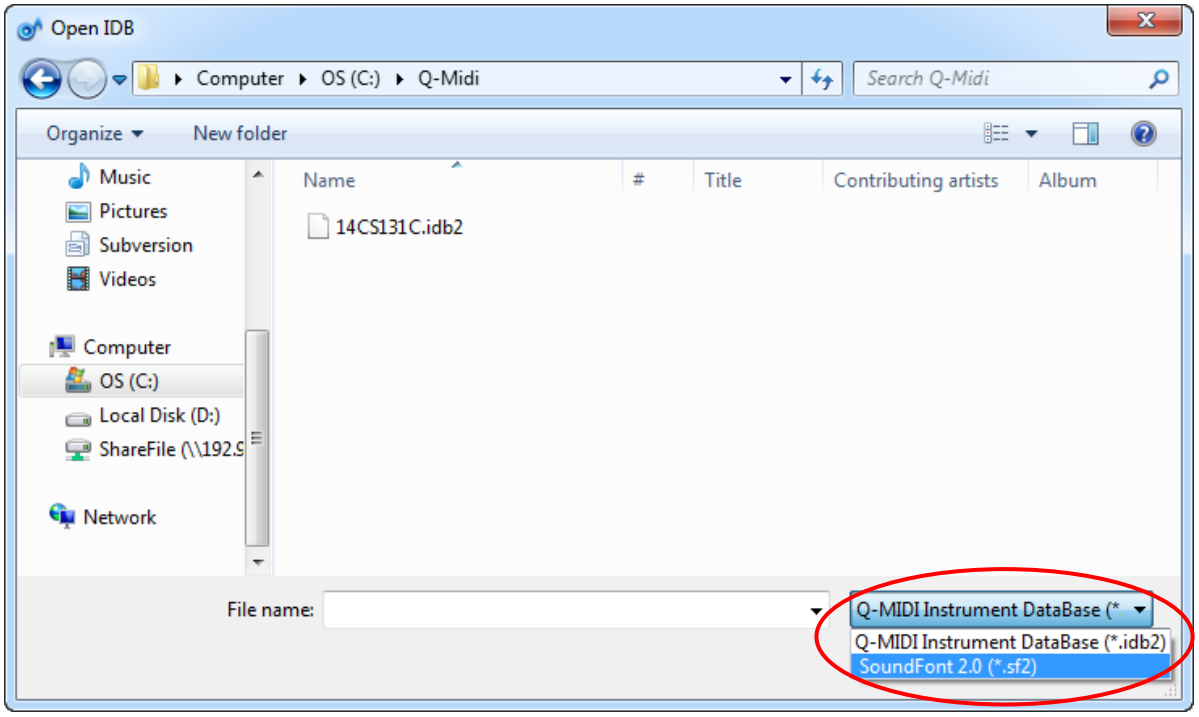
Close Project: Close the current project.

New IDB…: Create a new IDB file and its file extension is .idb2, as shown below.



- **Name:** Name of the new instrument database.
- **Location:** The location to store the new instrument database.

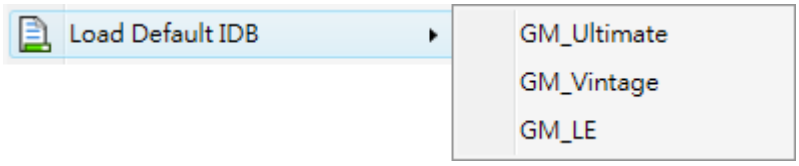
Open IDB…: Open an existing IDB (.idb2) or SoundFont (.sf2) file. If a .sf2 file is selected, *Q-MIDI* will convert the file to .idb2 and add it to project.



Save IDB: Save the current editing IDB.

Save IDB As…: Save the current IDB to the specified file path.

Load Default IDB: Load the default IDB and add to the project, as shown below.

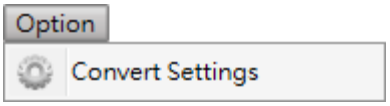


Merge IDB…: Merge the specified IDB or SF2 to an existing IDB. If the instrument already has a subpatch in the merge process, the following message will pop up to ask how to deal with.

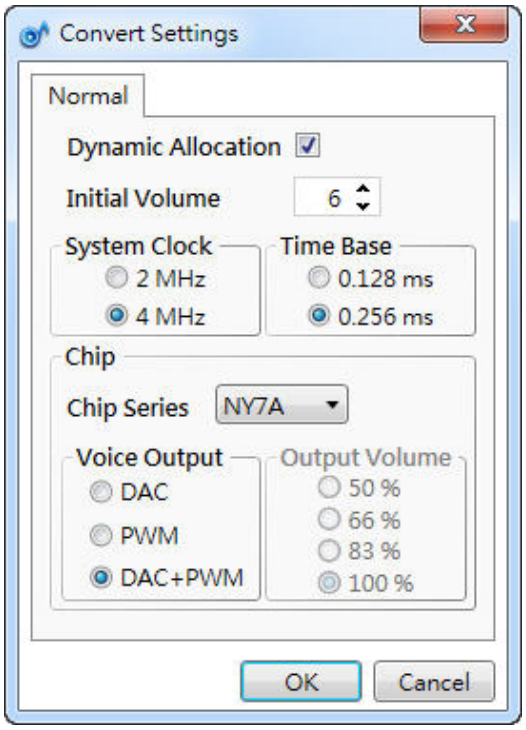
Recent Projects: List of the most recently used projects. Click on one to open.

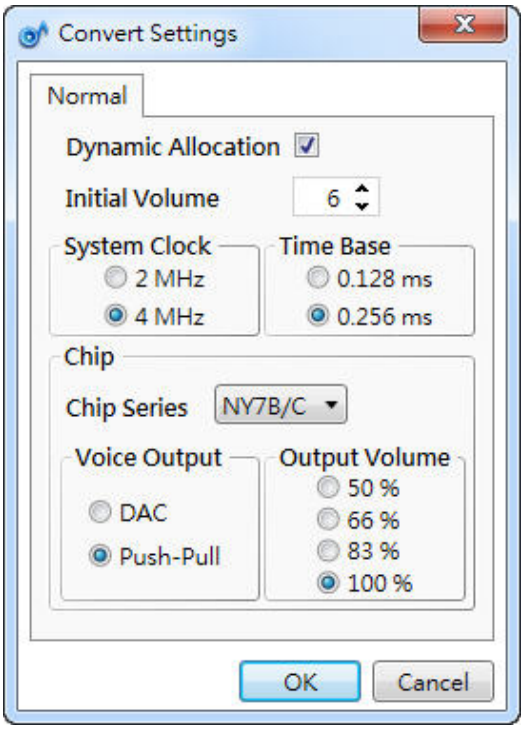
Exit: Exit *Q-MIDI*.

2.1.2 Option



Convert Settings: Settings for converting files. The window is shown below.





Dynamic Allocation: When Dynamic Allocation is checked, MIDI notes in 1~16 channels will be assigned to 8 channels to be played as possible; when it is unchecked, only notes in 1~8 channels, one note at once for each channel, will be played.

Initial Volume: Initial Volume is the initial playback volume of .mid files. The range of volume is from 1 to 15. A larger number means the higher volume. Default is 6.

System Clock: User can set system clock rate to 4MHz or 2MHz. Default is 4MHz.

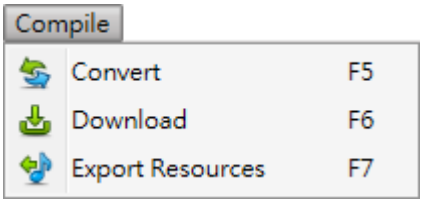
Time Base: NY7 synthesizer is based on time base clock to provide a periodical time-out signal to produce a regular internal interrupt**.** There are 2 kinds of Time Base: 0.128 and 0.256ms. Default is 0.256ms. If setting a less Time Base value, the outcome is more delicate, (ex. more accurate beat and tempo) as the interrupt event is occurred more shortly for servicing. However, it will occupy much more system resource, and vice versa.

Chip Series: NY7 series provide 2 selections: NY7A and NY7B/C. A new project is default as NY7B/C.

Voice Output: Different IC series has different Voice Output settings. When NY7A series is selected, the Voice Output will be DAC, PWM or PWM+DAC mode. IC will automatically detect the speaker connected pins to determine if output voice via PWM or DAC. When NY7B/C is selected, user can choose Push-Pull or DAC, and default is Push-Pull.

Output Volume: This is the built-in Push-Pull amplifier's analog volume setting. It provides 4 options: 100%, 83%, 66% and 50%. Default is 100%. This setting is only available for NY7B/C.

2.1.3 Compile

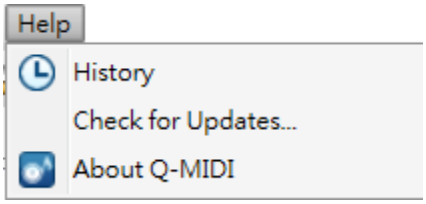


Convert: Convert the current editing .idb2 files and the selected .mid files to .md3 file for used in *Q-Code* program.

Download: Convert the current editing .idb2 files and the selected .mid files to .bin file, and then is downloaded via *Q-Writer* for rehearsal.

Export Resources: Export the .m7x, .v7x or .en7 files of the project for developing *NYIDE* program.

2.1.4 Help



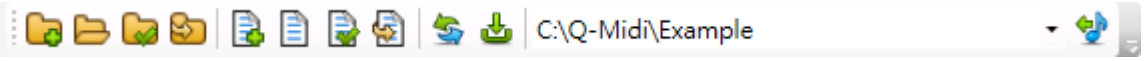
History: View the revision history of *Q-MIDI*

Check for Updates…: Check for the latest version of *Q-MIDI.* This function will connect to the Internet.

About Q-MIDI: Show current *Q-MIDI* version and the contact information for technical support.

2.2 Toolbar

Toolbar is under the menu bar. The buttons on toolbar provide shortcuts to activate functions that are commonly used, which allows user to access desired functions quickly without selecting them from the menu bar.

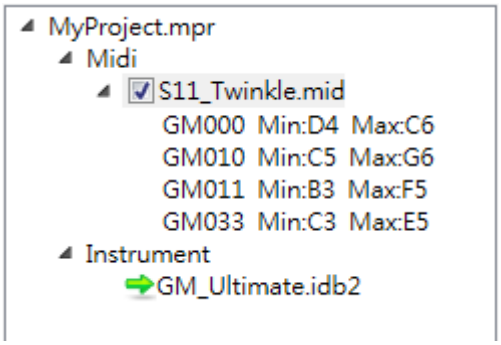


The descriptions of toolbar menu items are as follows:

Icon	Function	Descriptions
	New Project…	Create a project (.mpr).
	Open Project…	Open an existing project (.mpr) file.
	Save Project	Save the current project.
	Save Project As…	Save the current project to the specified file path.
	New IDB…	Create a new Instrument Database (.idb2).
	Open IDB…	Open an existing Instrument Database (.idb2).
	Save IDB	Save currently used .idb2 file.
	Save IDB As…	Save the currently used .idb2 file to the specified file path.
	Convert	Convert the currently used .idb2 and the selected .mid to .md3 files which can be used to develop *Q-Code* program.
	Download	Convert currently used .idb2 and the selected .mid to .bin file, and then is downloaded to IC via Q-Writer.
	Export Resources Path	Specify the path for the output files.
	Export Resouces	Export resources (ex. the .bin files for Demo, the .md3 for *Q-Code*, and the .m7x, .v7x, .en7 files for *NYIDE*.) to the specified file path

2.3 Project Manager

User can add .mid files and set the instruments of IDB file. The interface is shown below.



Take the above picture for example, the .mid file uses 4 kinds of instruments. The detail is shown below.

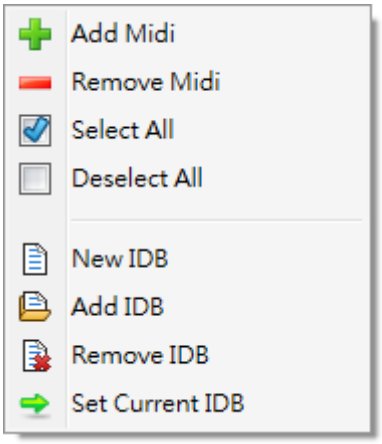
GM000 Min:D4 Max:C6

Red underline means General(GM) or Percussion(Perc).

Blue underline means this instrument number is expressed in 3-digit number.

Green underline means the minimum and maximum pitch of this instrument.

User can edit mid and IDB files via the context menu, which is shown upon right-click.



Add MIDI: Add mid files to project. When a mid file is added, its default status is ticked, which means this .mid file is included when converting.

Remove MIDI: Remove the current ticked mid file.

Select All: Select all of the .mid files.

Deselect All: Clear the check box of all .mid files.

New IDB: Create a new IDB file and add it to project.

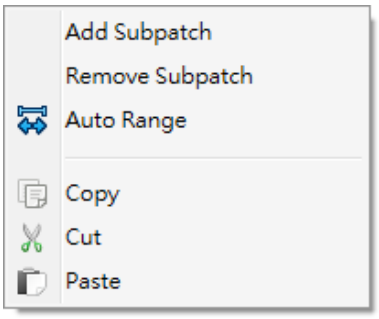
Add IDB: Add the specified IDB (.idb2) or SoundFont (.sf2) file. If .sf2 file is selected, *Q-MIDI* will convert the file as .idb2 and add it to project.

Remove IDB: Remove the current selected IDB file.

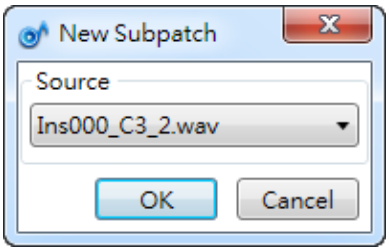
Set Current IDB: Set the current IDB as instrument database used when playing mid file.

2.4 Instrument Manager

The Instrument Manager is to create the timbres for instrument database. It consists of 2 categories: Instrument and Percussion. User can edit the subpatch of instruments using context menu. Only one subpatch is allowed in percussion. The context menu is shown below.



Add Subpatch: Set the source file of subpatches to create and add subpatches to the specified kinds of instrument. The window is shown below.



Remove Subpatch: Remove the current selected subpatch.

Auto Range: Extend pitch range of the selected subpatch to max valid playback-frequency range.

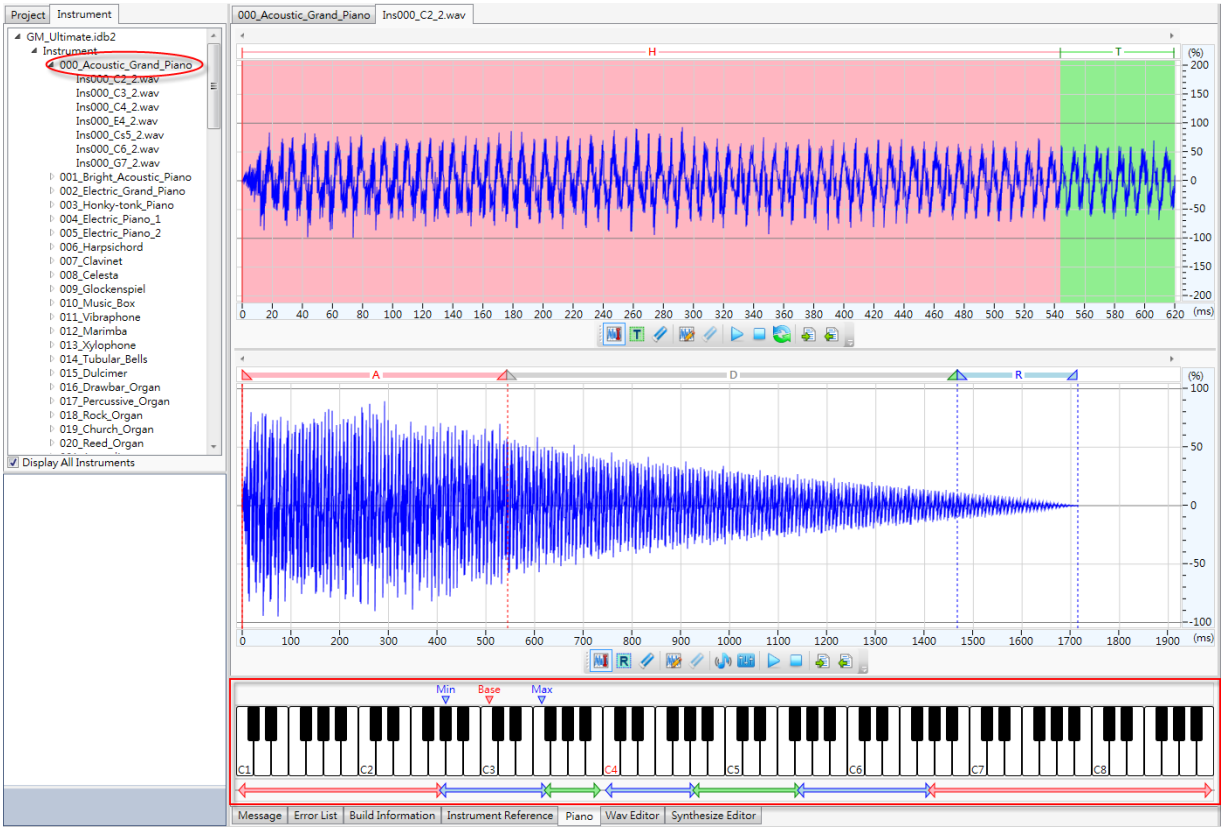
Copy: Copy the selected subpatch.

Cut: Cut the selected subpatch.

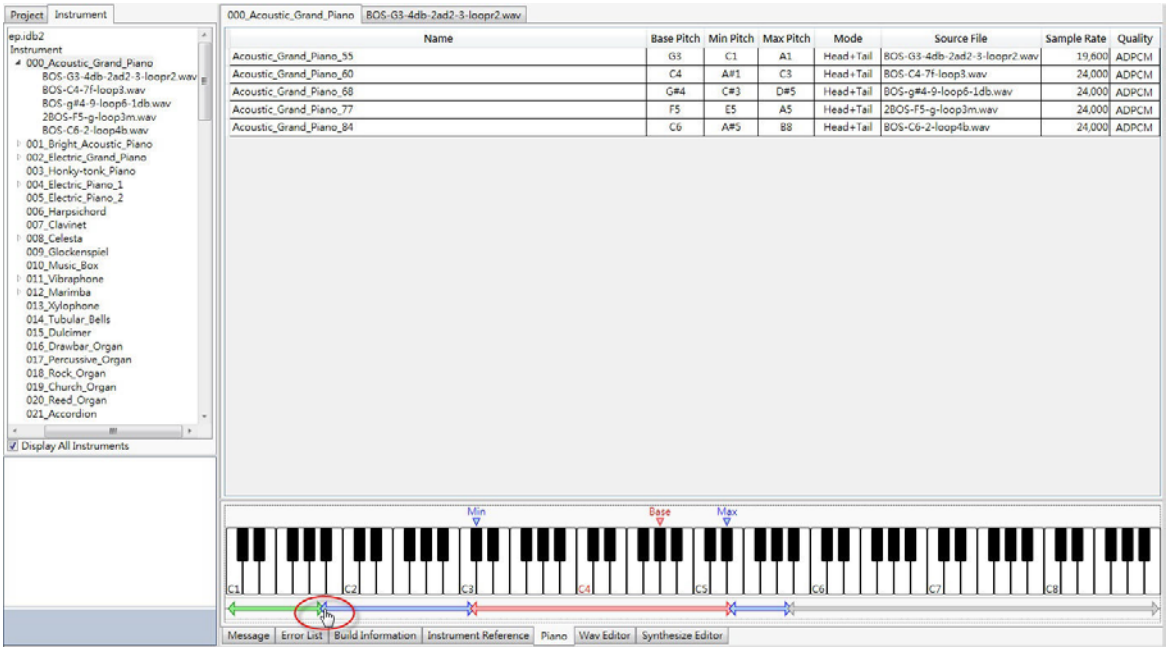
Paste: Paste the previous copied or cut subpatch to the current specified instrument.

After all subpatches of an instrument have been edited, user can then set the pitch range of each subpatch. The setting procedure is as follows.

Step1 〉Move cursor to the desired instrument and press the left mouse button, the pitch range of all subpatches will be shown in the Piano tab of Information Window.



Step2 〉Move cursor to the either arrow end of the pitch range, then press and hold the left mouse button to drag leftward / rightward, the adjacent pitch range of subpatches will shift leftward / rightward automatically without overlapping pitch.

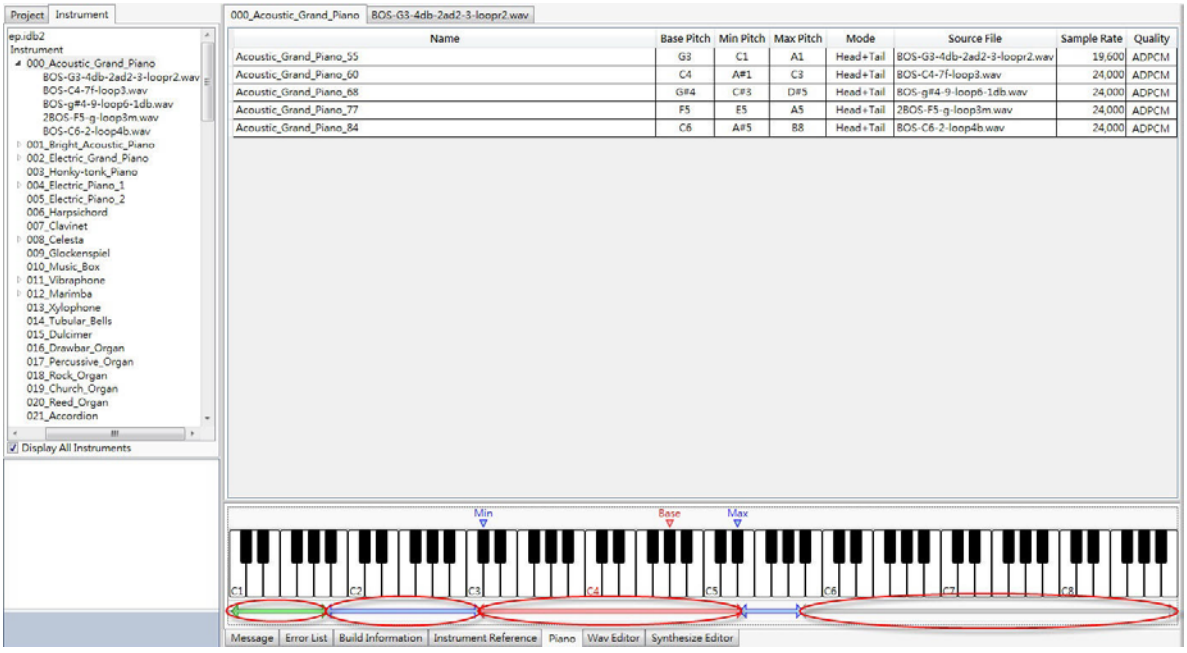


Step3 〉While dragging the arrow, the color of pitch range might be changed if the pitch range has out of the support range of IC. Colors are described as follows.

Blue or Green: Valid pitch range.

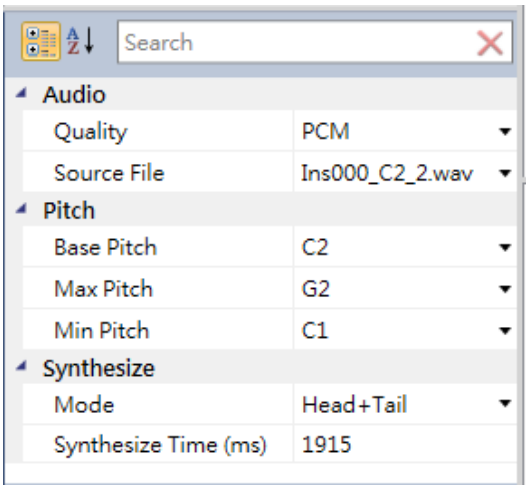
Red: The playback result might not be as expected, user needs to download and confirm with the rehearsal.

Grey: The pitch range exceeds the supported range of IC. If user applies this subpatch, there is no sound output when playing files.



2.5 Subpatch Property Window

The Subpatch Property Window shows the property items of the current edited subpatch: Quality, Source File, Base Pitch, Max Pitch, Min Pitch, Mode and Synthesize Time. The Property window is shown below.



Quality: *Q-MIDI* provide 2 kinds of sound quality: ADPCM and PCM

- ADPCM: The compressed 6-bit ADPCM algorithm format. Nice quality and can reduce ROM usage effectively.
- PCM: The non-compressed PCM which can keep the best quality of original file but cost more ROM.

Source File: Select the source of subpatch. User can added wav source files from Wav Manager.

Base Pitch: Set the base pitch of subpatch.

Max Pitch: The supported highest pitch of the subpatch.

Min Pitch: The supported lowest pitch of the subpatch.

Mode: There are 3 modes: Head + Tail, Head Only and Tail Only.

- Head + Tail: The timbre is synthesized by Head and Tail section, which is edited in Wav Editor.
- Head Only: The entire wav source is used for synthesizing.
- Tail Only: Only Tail section is used for synthesizing, which can be edited in Wav Editor.

Synthesize Time: The length of time to be shown on Synthesizer Editor, the unit is ms.

2.6 Instrument Table

The Instrument Table shows information of subpatch: Name, Base Pitch, Min Pitch, Max Pitch, Mode, Source File and Quality. The window is shown below.

000_Acoustic_Grand_Piano

Name	Base Pitch	Min Pitch	Max Pitch	Mode	Source File	Sample Rate	Quality
Acoustic_Grand_Piano_36	C2	C1	G2	Head+Tail	Ins000_C2_2.wav	22,024	PCM
Acoustic_Grand_Piano_48	C3	G#2	F3	Head+Tail	Ins000_C3_2.wav	16,348	PCM
Acoustic_Grand_Piano_60	C4	F#3	B3	Head+Tail	Ins000_C4_2.wav	22,000	PCM
Acoustic_Grand_Piano_64	E4	C4	G#4	Head+Tail	Ins000_E4_2.wav	19,776	PCM
Acoustic_Grand_Piano_73	C#5	A4	F#5	Head+Tail	Ins000_Cs5_2.wav	15,510	PCM
Acoustic_Grand_Piano_84	C6	G5	G6	Head+Tail	Ins000_C6_2.wav	16,760	PCM
Acoustic_Grand_Piano_103	G7	G#6	B8	Head+Tail	Ins000_G7_2.wav	18,816	PCM

Name: The subpatch name.

Base Pitch: The base pitch of subpatch.

Min Pitch: The supported highest pitch of the subpatch.

Max Pitch: The supported lowest pitch of the subpatch.

Mode: Synthesizing methods for timbre, there are 3 modes: Head + Tail, Head Only and Tail Only.

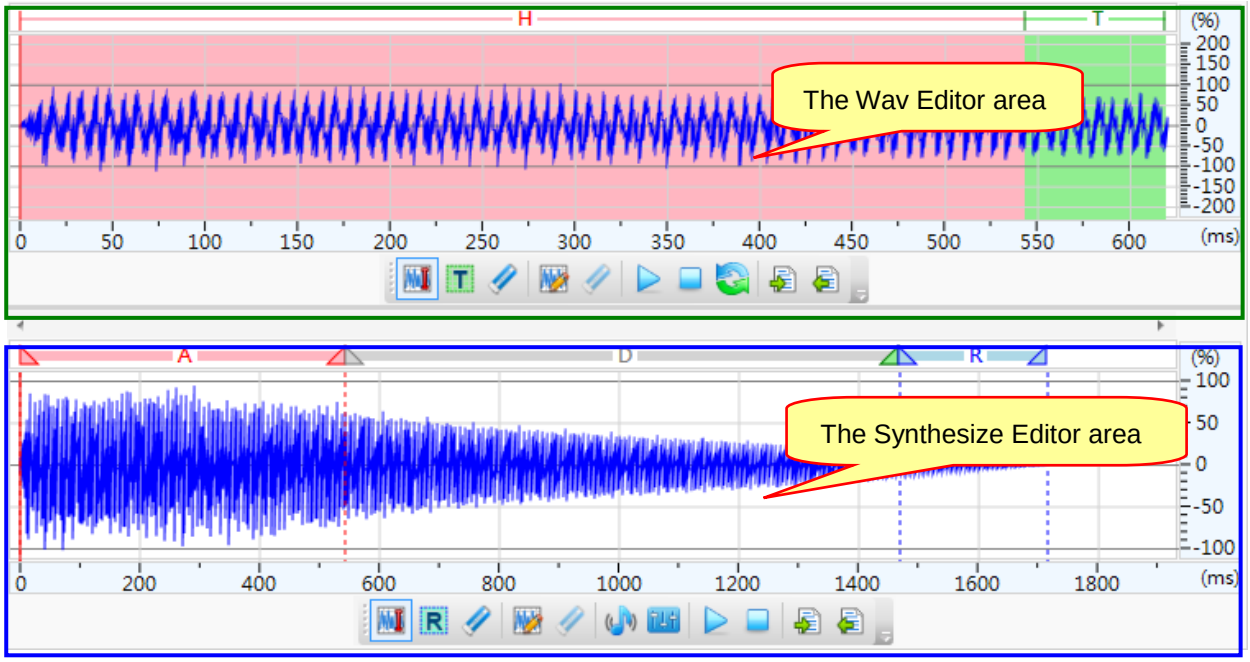
Source File: The source of subpatch.

Sample Rate: The sample rate of wav source.

Quality: The sound quality of subpatch includes ADPCM and PCM. User can switch between the two by double clicking the left mouse button.

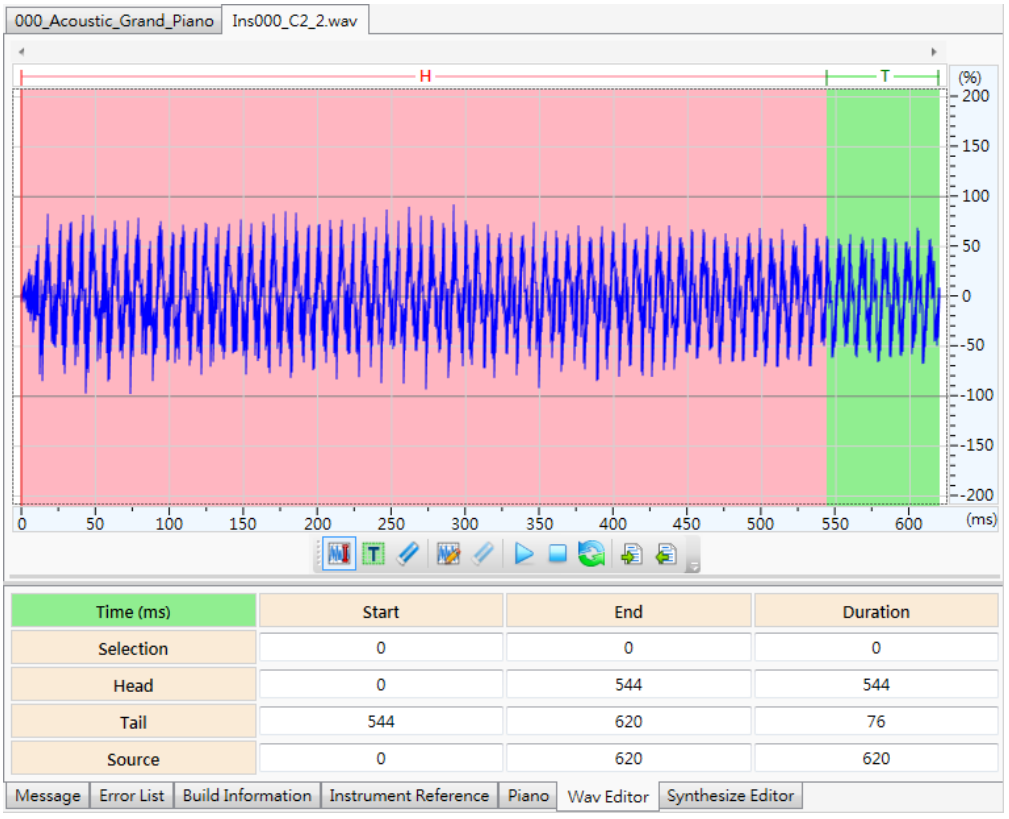
2.7 Subpatch Editor

The Subpatch Editor tab is divided into 2 areas: Wav Editor and Synthesize Editor.



2.7.1 Wav Editor

This section is for setting Tail and Envelope to adjust from the original wav source.



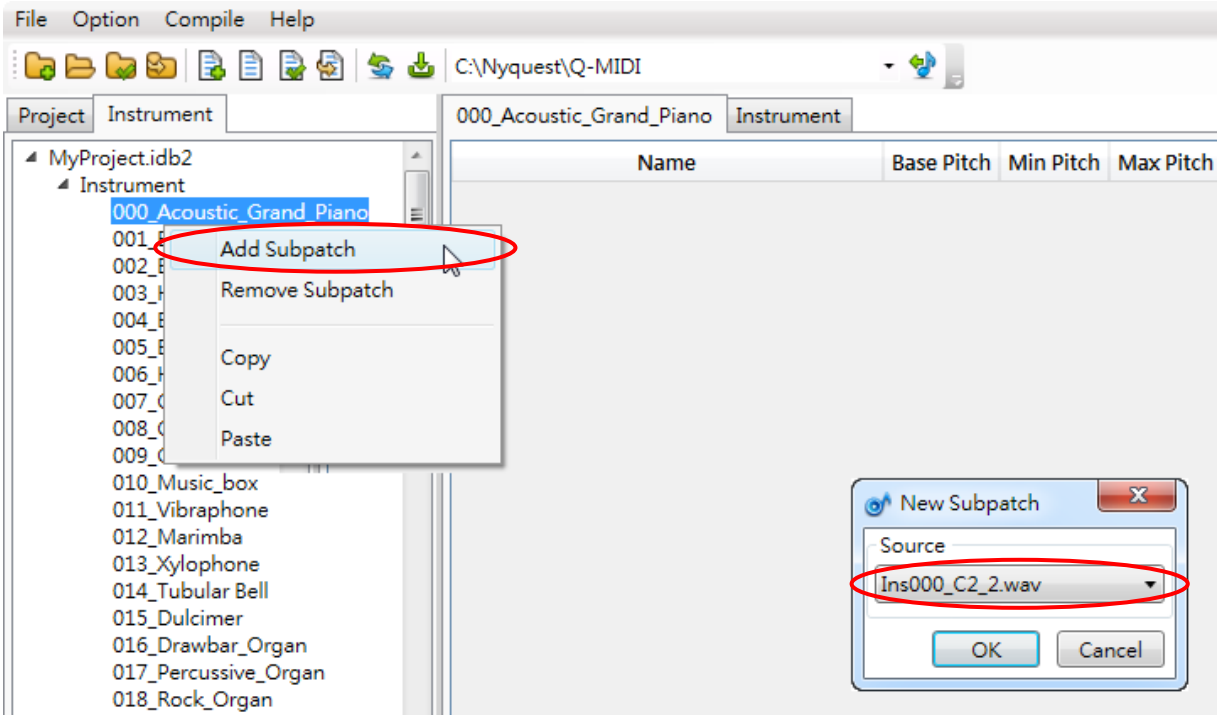
User can set and edit the Tail and Envelope curve by toolbar or context menu. The descriptions are listed below.

Icon	Function	Descriptions
	Select Mode	Drag and set Tail section under Select Mode.
	Set Tail Section	Set the selected range as Tail section.
	Clear Tail Section	Clear the current Tail section setting.
	Pencil Mode	Pencil Mode is used for editing source files by dragging envelope points.
	Clear All	Clear all the edited points of Envelope.
	Play	Play the synthesized result of edited envelope.
	Stop	Stop playback.
	Loop	Loop playback.
	Import	Import envelope curve file (.ev1).
	Export	Export the current edited envelope curve as .ev1 file.

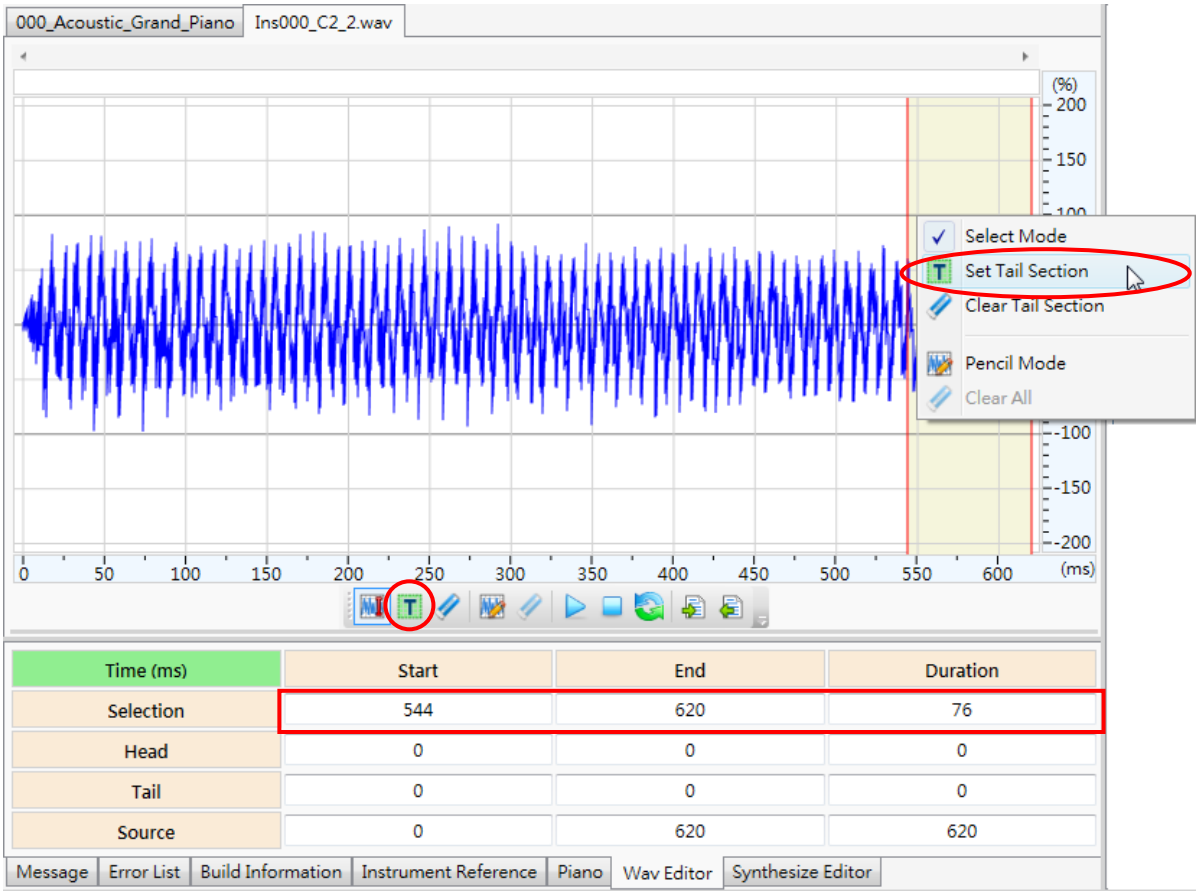
◆ Set Tail section

In Select Mode, set Tail section then Head section is also set as from beginning to Tail Section. The Mode of Property Window will determine if both sections are used to synthesize the source in Synthesize Editor. An example is illustrated as below.

Step1 〉Select Add Subpatch and set the wav source to Ins000_C2_2.wav.



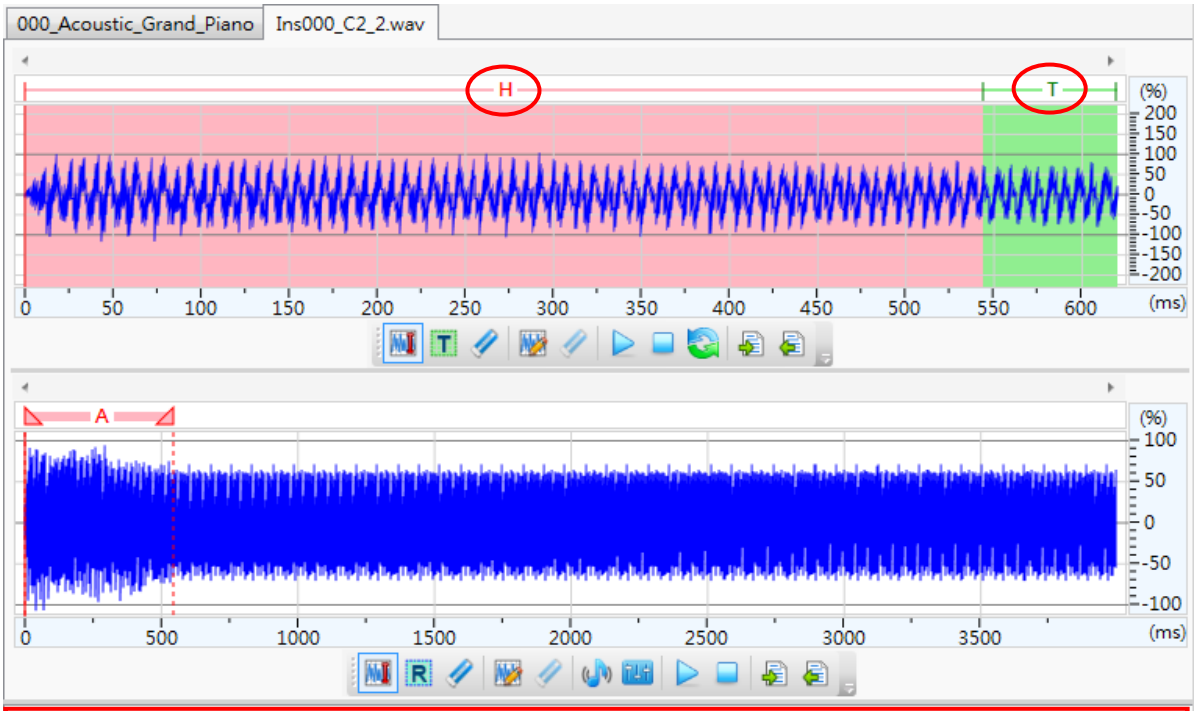
Step2 〉Find a range where the height of starting point and ending point are similar and close to 0%. The following example selects a range of 544 ~ 620 ms. Set the tail section using Set Tail Section on context menu or toolbar.



Time (ms)	Start	End	Duration
Selection	544	620	76
Head	0	0	0
Tail	0	0	0
Source	0	620	620

Message | Error List | Build Information | Instrument Reference | Piano | Wav Editor | Synthesize Editor

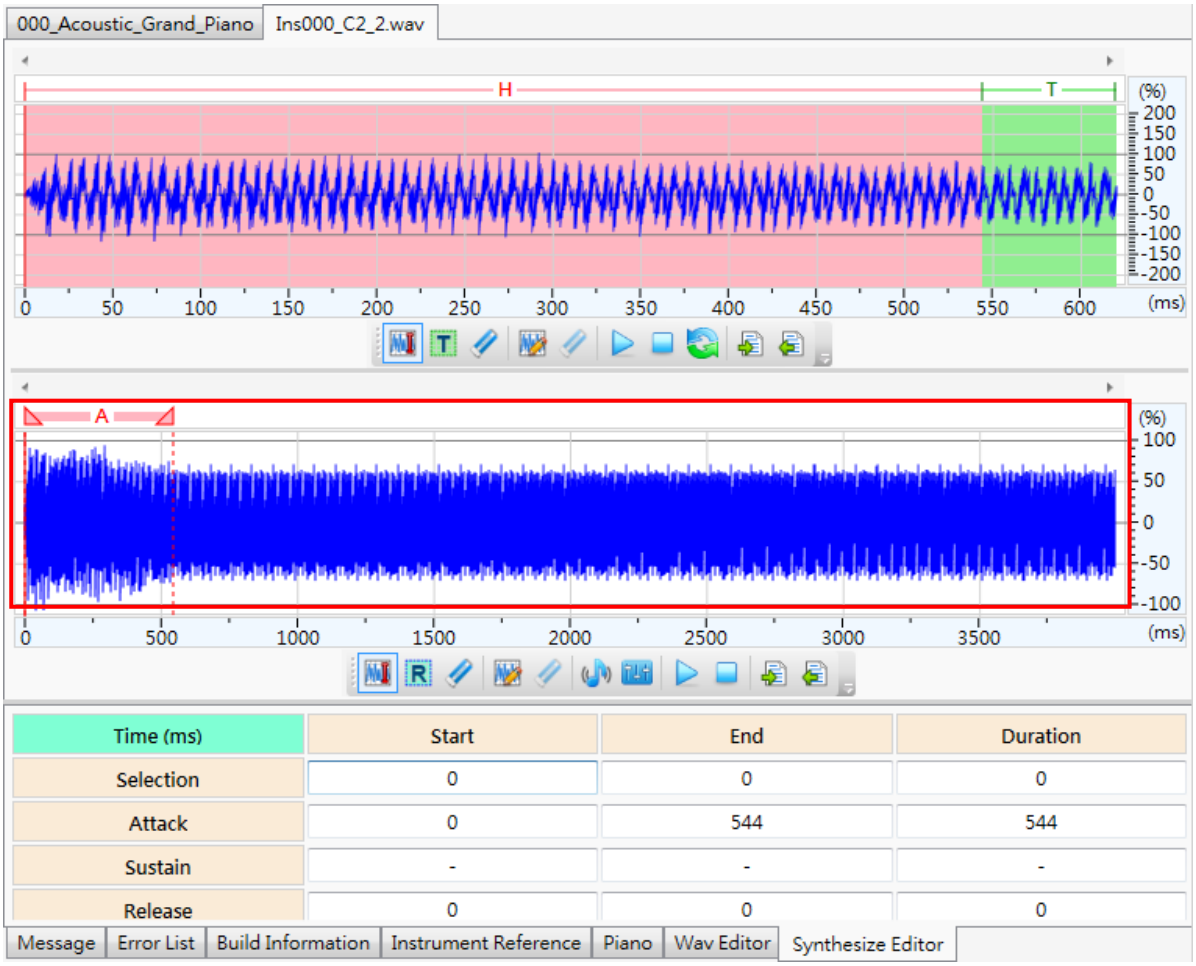
Step3 〉After setting the Tail section, the Head section and Tail section area are appeared in Wav Editor . The Information Window will show the information of the sections.



Time (ms)	Start	End	Duration
Selection	0	0	0
Head	0	544	544
Tail	544	620	76
Source	0	620	620

Message | Error List | Build Information | Instrument Reference | Piano | Wav Editor | Synthesize Editor

Step4 〉The Synthesize Editor tab will synthesize the sound based on the Head section, Tail section, Mode and Synthesize Time. The default length of Synthesizer Editor is 4000 ms.



Time (ms)	Start	End	Duration
Selection	0	0	0
Attack	0	544	544
Sustain	-	-	-
Release	0	0	0

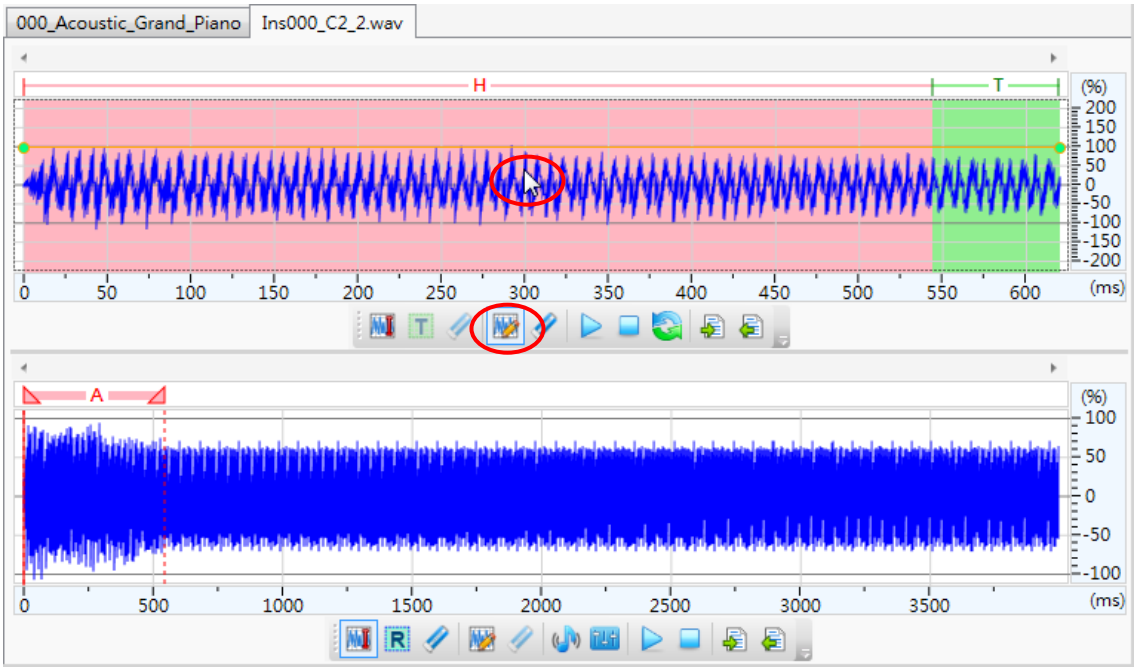
Message | Error List | Build Information | Instrument Reference | Piano | Wav Editor | Synthesize Editor

- Edit Envelope

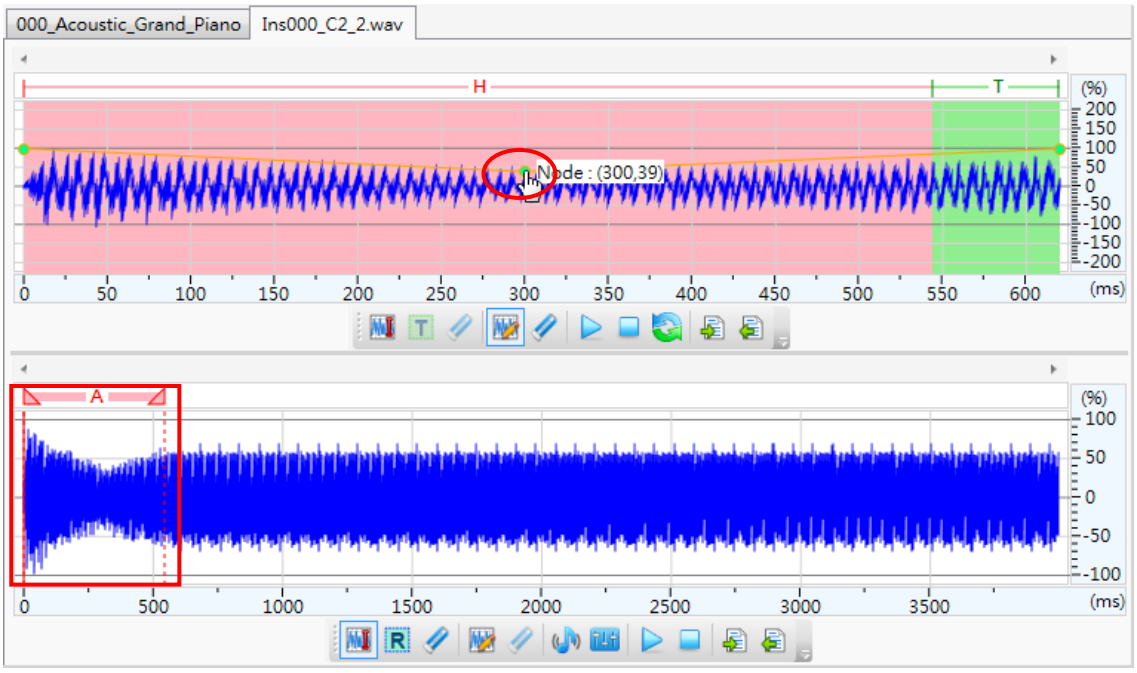
  User can edit envelope curve in pencil mode by using mouse.

- Add envelope point

  Step1 〉Move cursor to the specified position and click the left mouse button to add envelope point.

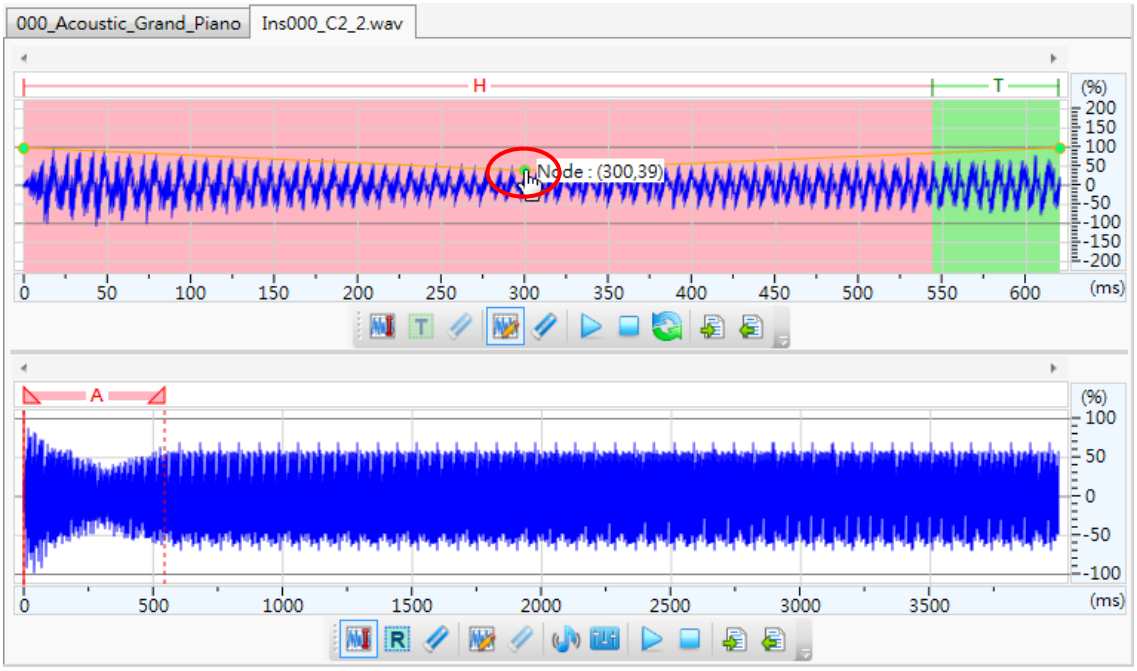


  Step2 〉After adding the point, *Q-MIDI* will mark the current location of the point and synthesize sound with the envelope curve, and the waveform of Synthesize Editor will be updated simultaneously.

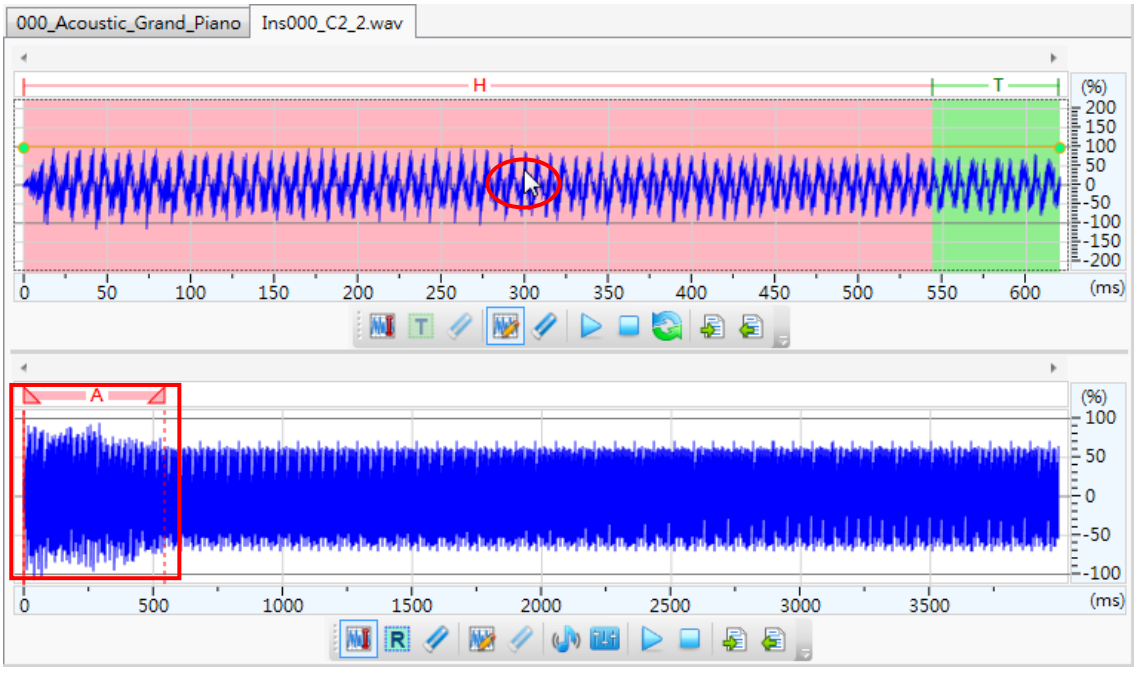


- Remove the envelope point

Step1 〉Move the cursor to the envelope point and click the right button to remove.

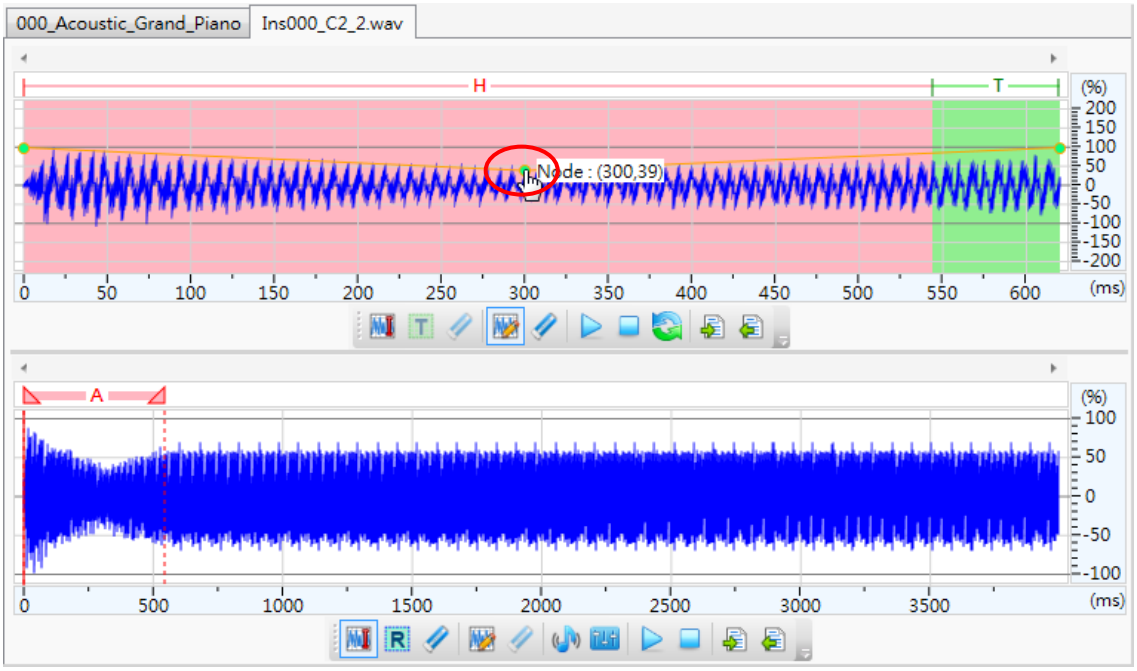


Step2 〉After removing the envelope point, *Q-MIDI* will synthesize sound with the envelope curve, and the waveform of Synthesize Editor will be updated simultaneously.

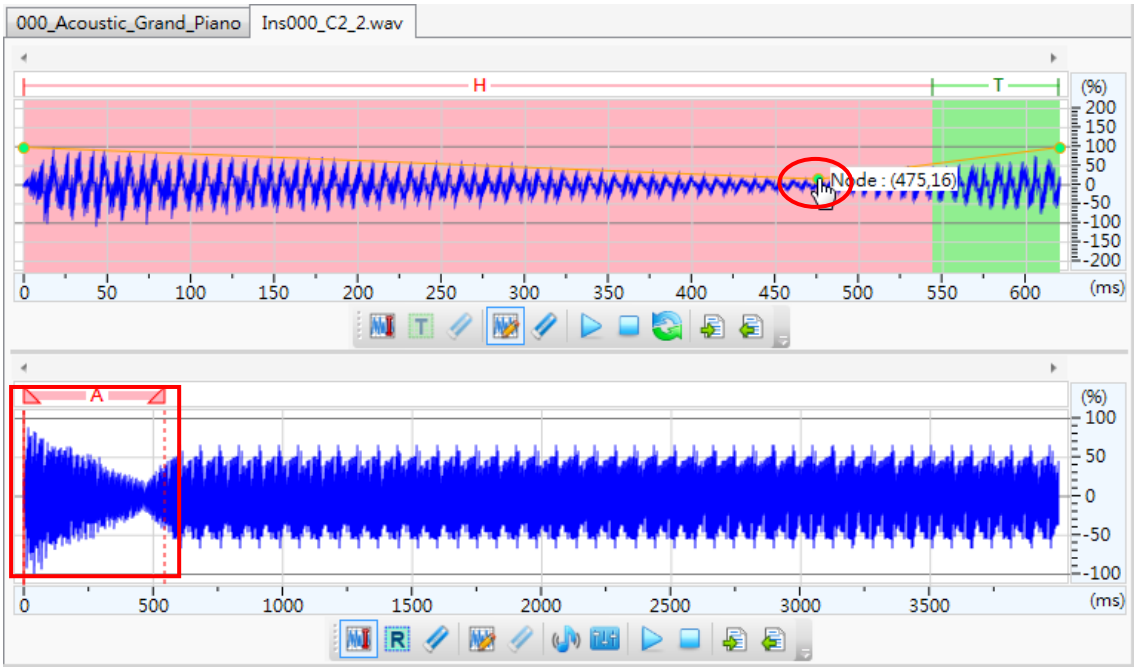


- Drag the envelope point

Step1 〉Move cursor to the envelope point, then press and hold the left mouse button.

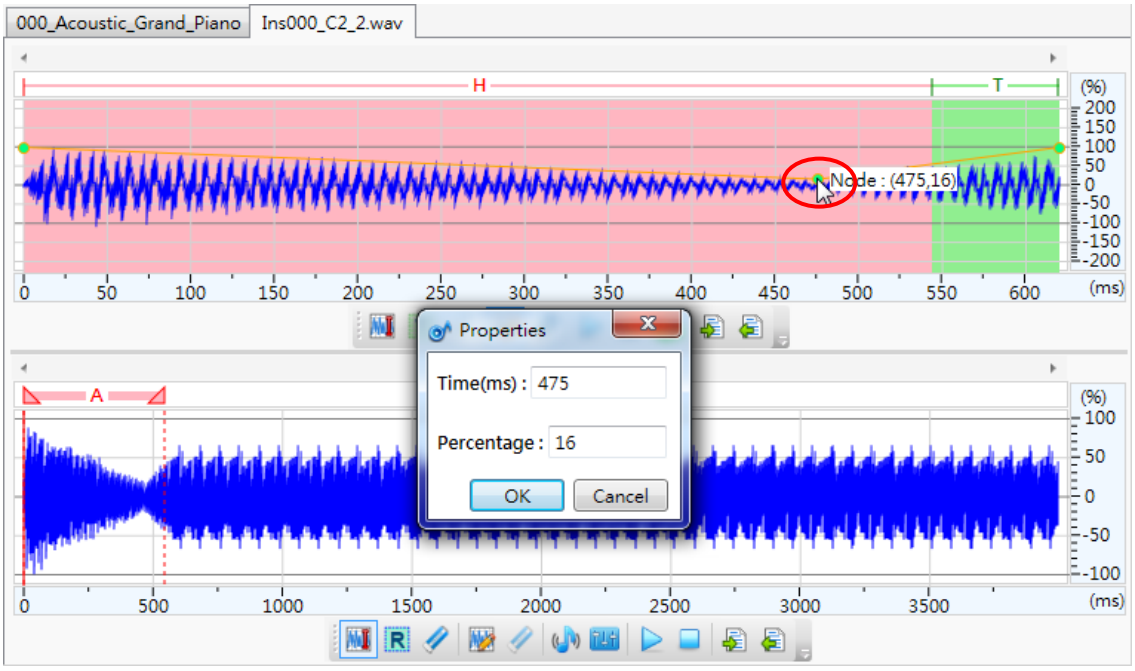


Step2 〉Press and hold the left button then drag the envelope point to the desired position. After releasing the button, *Q-MIDI* will synthesize sound with the envelope curve, and the waveform of Synthesize Editor area will be updated simultaneously.

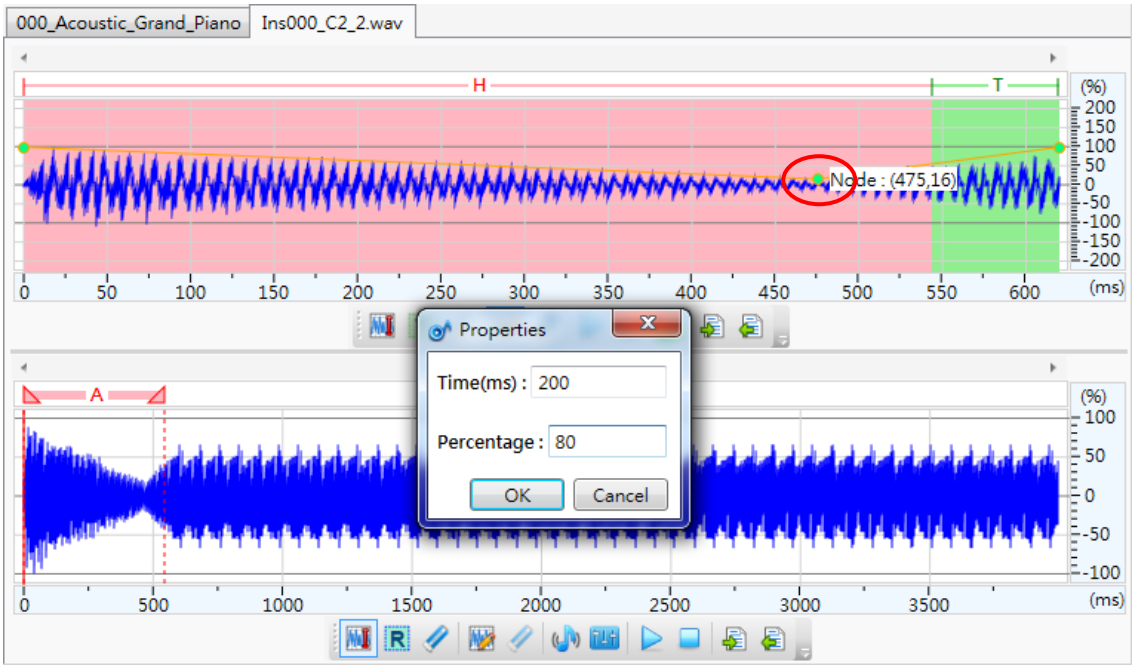


- Edit the envelope point

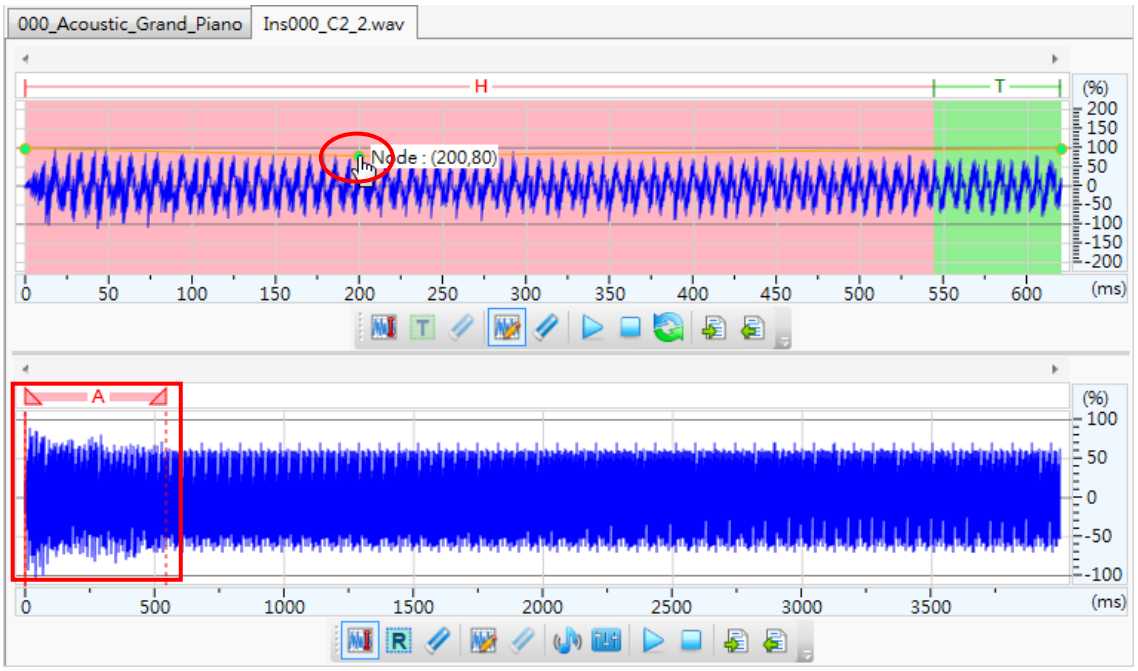
Step1 〉Move the cursor to the envelope point and double click the left button, the Properties window will pop-up as shown below.



Step2 〉User can then edit the positon of envelope point in the Properties window.



Step3 〉After click OK, *Q-MIDI* will synthesize sound with the envelope curve, and the waveform of Synthesize Editor will be updated simultaneously.



2.7.2 Synthesize Editor

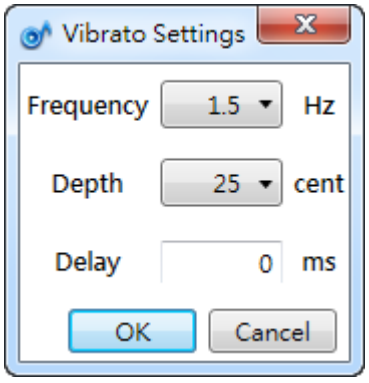
The Synthesize Editor is for simulating the synthesized result of subpatches after setting the ADSR section and editing the envelope curve.

User can set the ADSR section and edit the envelope curve by toolbar or context menu. The menu items are listed below.

Icon	Function	Descriptions
	Select Mode	Drag and set Tail section under Select Mode.
	Set Tail Section	Set the selected section as Tail section.
	Clear Tail Section	Clear the current Tail section setting.
	Pencil Mode	Pencil Mode is used for editing source files by dragging envelope points.

Icon	Function	Descriptions
	Clear All	Clear all the edited envelopes.
	Vibrato	Enable or disable vibrato.
	Vibrato Settings	Set vibrato frequency, pitch range and delay time.
	Play	Play the synthesized result of edited envelope.
	Stop	Stop playback.
	Import	Import envelope curve file (.ev1).
	Export	Export the current edited envelope curve as .ev1 file.

The Vibrato Settings window is shown below.



Frequency: There are 10 options of frequency. The greater the value, the higher frequency.

Depth: There are 8 options of depth. The greater the value, the wider pitch vibration. (Unit: cent)

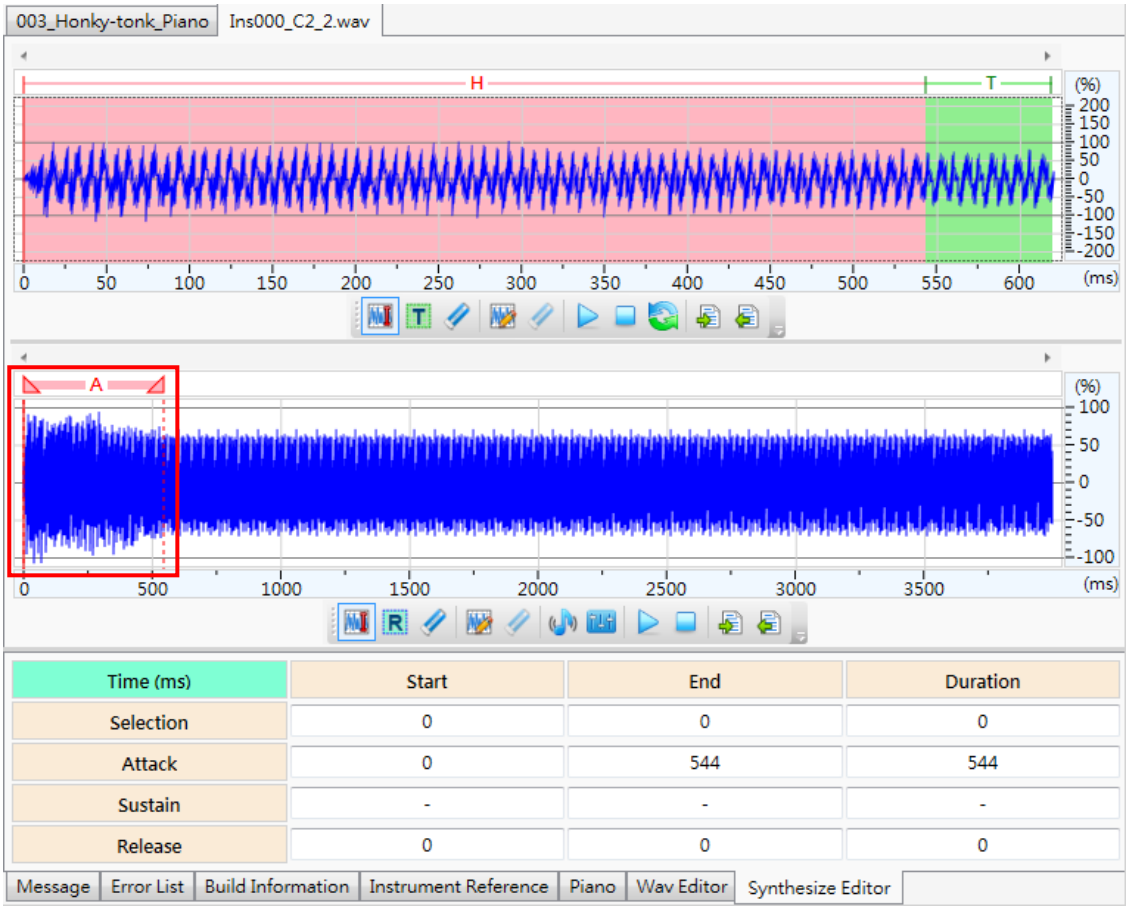
Delay: Set the delay time to postpone starting the vibrato effect. (Unit: ms)

In different modes, the settings are also different. The following describes each of them.

◆ Head + Tail: The Head + Tail mode uses the Head section and repeat the Tail section to synthesize sound.

- Set the ADSR section: Please refer to Appendix 3.1 for the detailed description of ADSR.

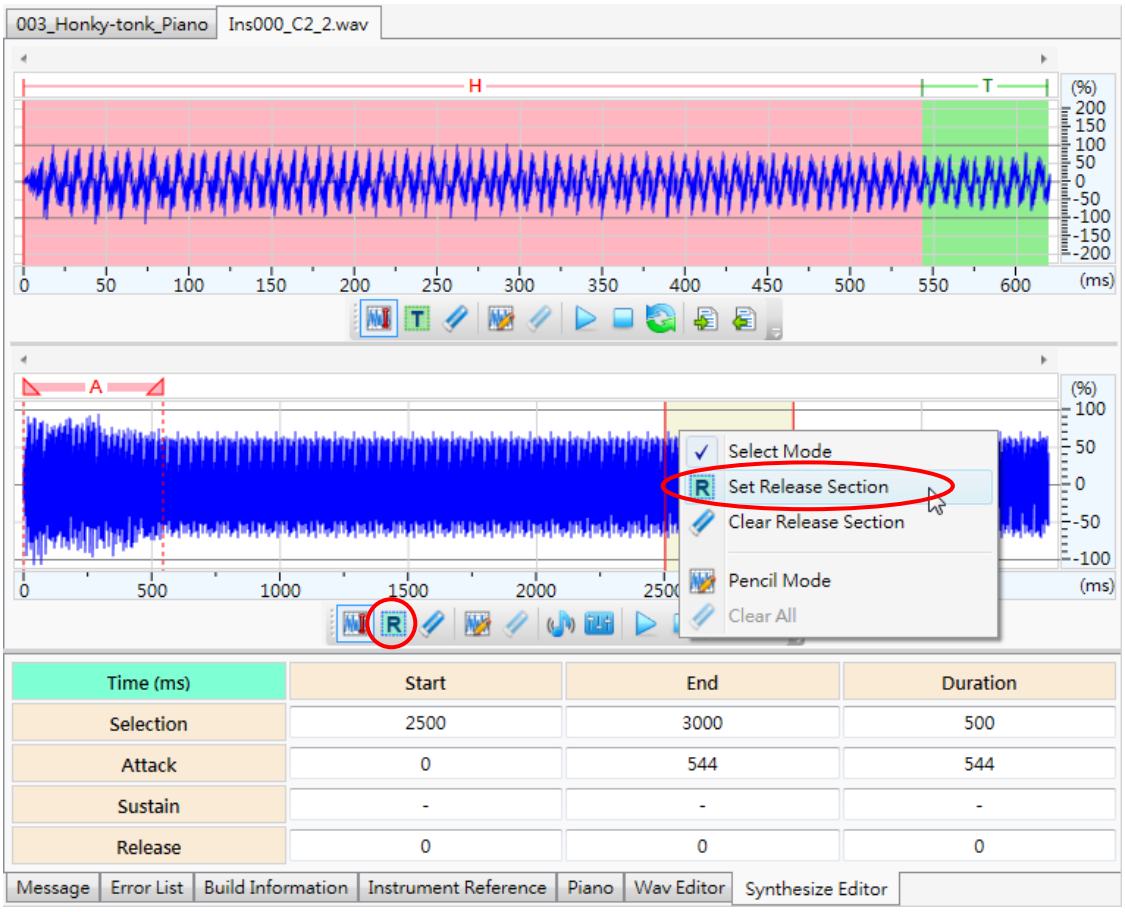
Step1 〉After setting the Tail section in the Wav Editor, the Synthesize Editor will show the synthesized waveform and mark the Attack section.



Time (ms)	Start	End	Duration
Selection	0	0	0
Attack	0	544	544
Sustain	-	-	-
Release	0	0	0

Message | Error List | Build Information | Instrument Reference | Piano | Wav Editor | Synthesize Editor

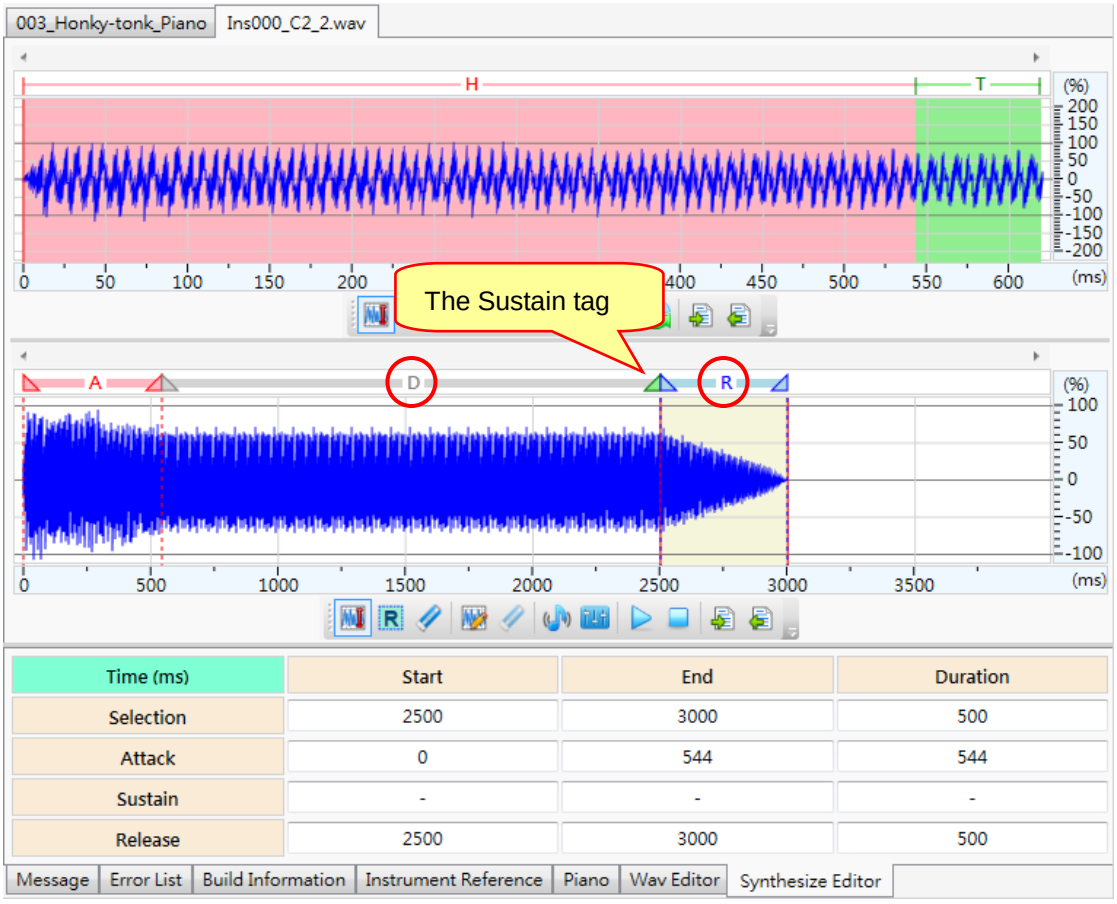
Step2 〉Select a range to set the Release section by using toolbar or the context menu.



Time (ms)	Start	End	Duration
Selection	2500	3000	500
Attack	0	544	544
Sustain	-	-	-
Release	0	0	0

Message | Error List | Build Information | Instrument Reference | Piano | Wav Editor | Synthesize Editor

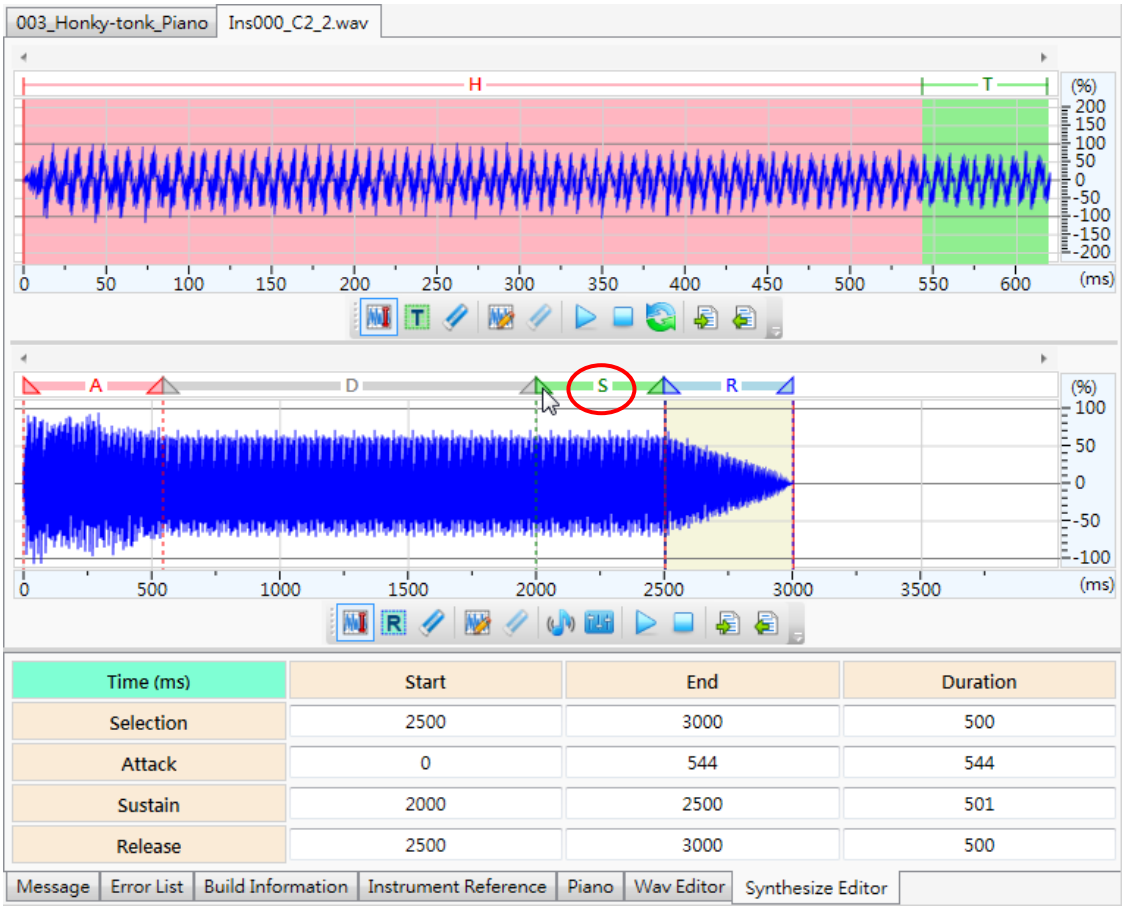
Step3 〉After setting, the Synthesize Editor will mark the Decay section and Release section, and the Sustain tag will appear on top of the starting position of Release section.



Time (ms)	Start	End	Duration
Selection	2500	3000	500
Attack	0	544	544
Sustain	-	-	-
Release	2500	3000	500

Message | Error List | Build Information | Instrument Reference | Piano | Wav Editor | Synthesize Editor

Step4 〉Move cursor to the Sustain tag, press and hold the left mouse button, then dragging the tag leftward, the Sustain section will appear.

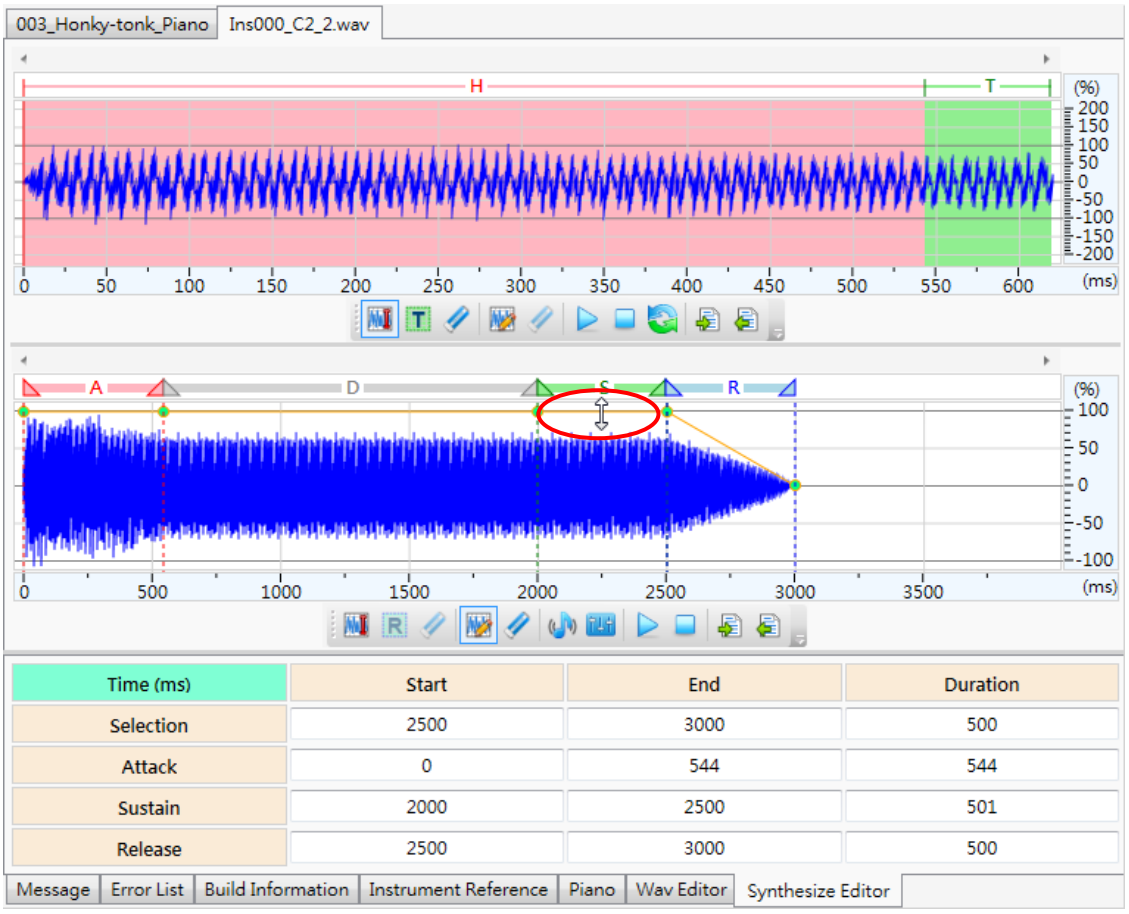


Time (ms)	Start	End	Duration
Selection	2500	3000	500
Attack	0	544	544
Sustain	2000	2500	501
Release	2500	3000	500

Message | Error List | Build Information | Instrument Reference | Piano | Wav Editor | Synthesize Editor

- Edit the envelope curve

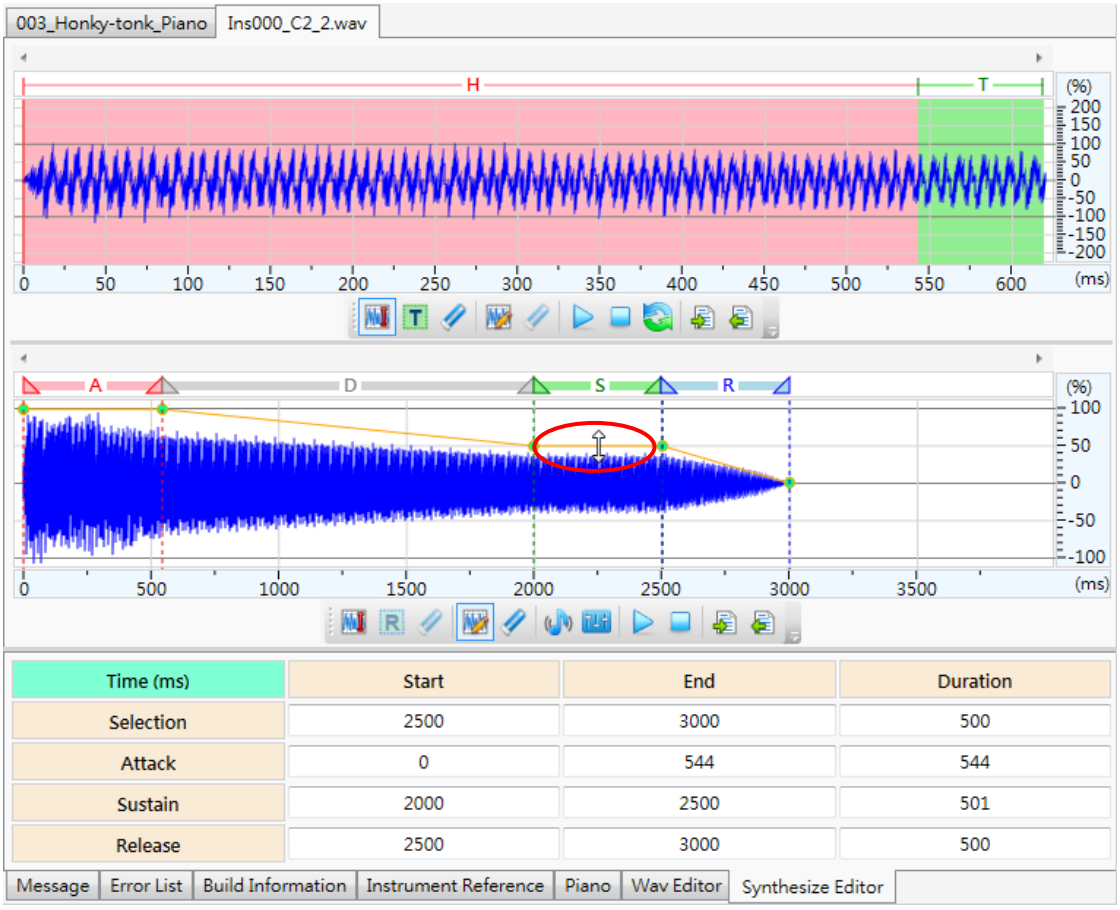
  Step1 〉In pencil mode, move cursor to the Sustain section and the cursor will turn into up-down arrow.



Time (ms)	Start	End	Duration
Selection	2500	3000	500
Attack	0	544	544
Sustain	2000	2500	501
Release	2500	3000	500

Message | Error List | Build Information | Instrument Reference | Piano | Wav Editor | Synthesize Editor

Step2 〉Press and hold the left mouse button, and drag the up-down arrow up and down to the desired position, the Synthesize Editor will synthesize the wav with the envelope curve after releaseing the button, and the waveform will be updated.



Time (ms)	Start	End	Duration
Selection	2500	3000	500
Attack	0	544	544
Sustain	2000	2500	501
Release	2500	3000	500

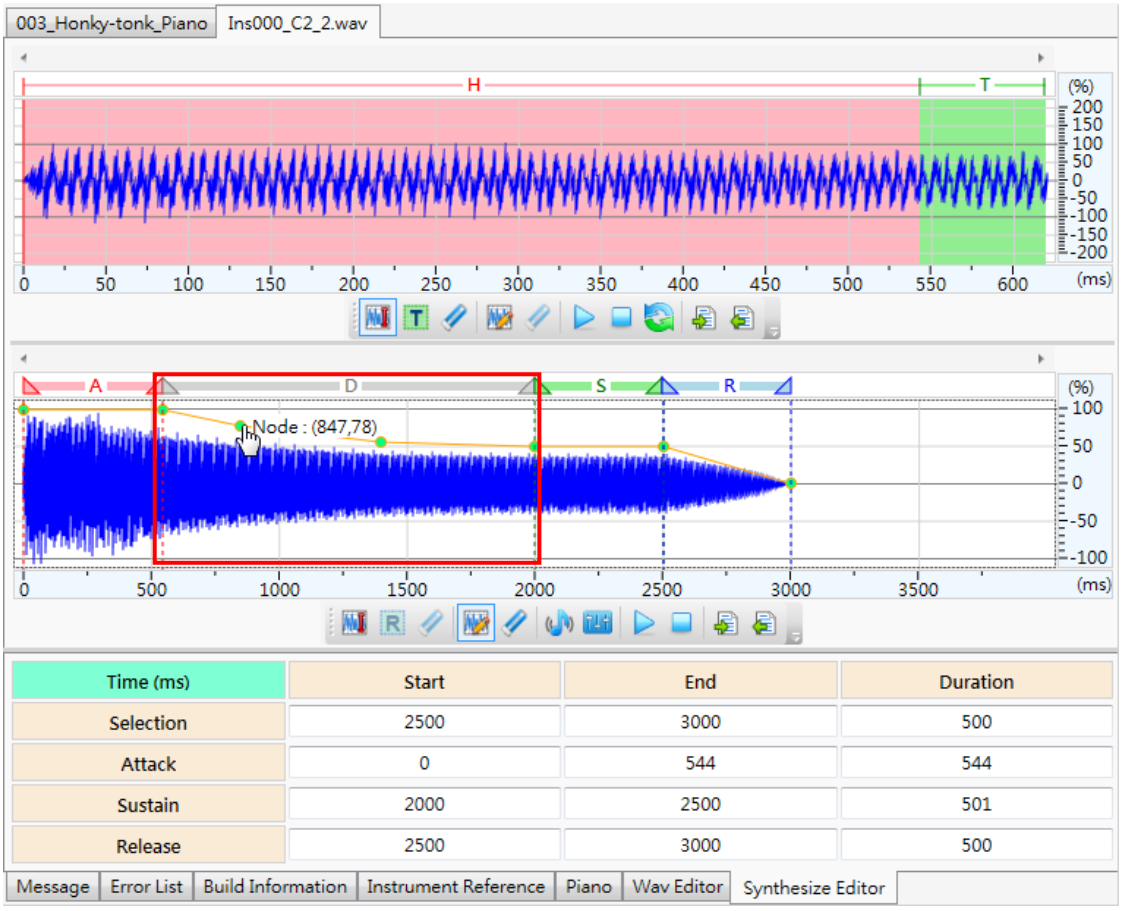
Message | Error List | Build Information | Instrument Reference | Piano | Wav Editor | Synthesize Editor

Step3 〉Move cursor to the Decay section to add / remove / drag the envelope point for adjusting the envelope curve.

Add an envelope point: Move curosr to the desired position and press the left mouse button to add an envelope point.

Remove the envelope point: Move cursor to an envelope point and press the right button on mouse to delete the envelope point.

Drag the envelope point: Move cursor to the envelope point, press and hold the left mouse button until dragging the envelope point to the desired position.



Time (ms)	Start	End	Duration
Selection	2500	3000	500
Attack	0	544	544
Sustain	2000	2500	501
Release	2500	3000	500

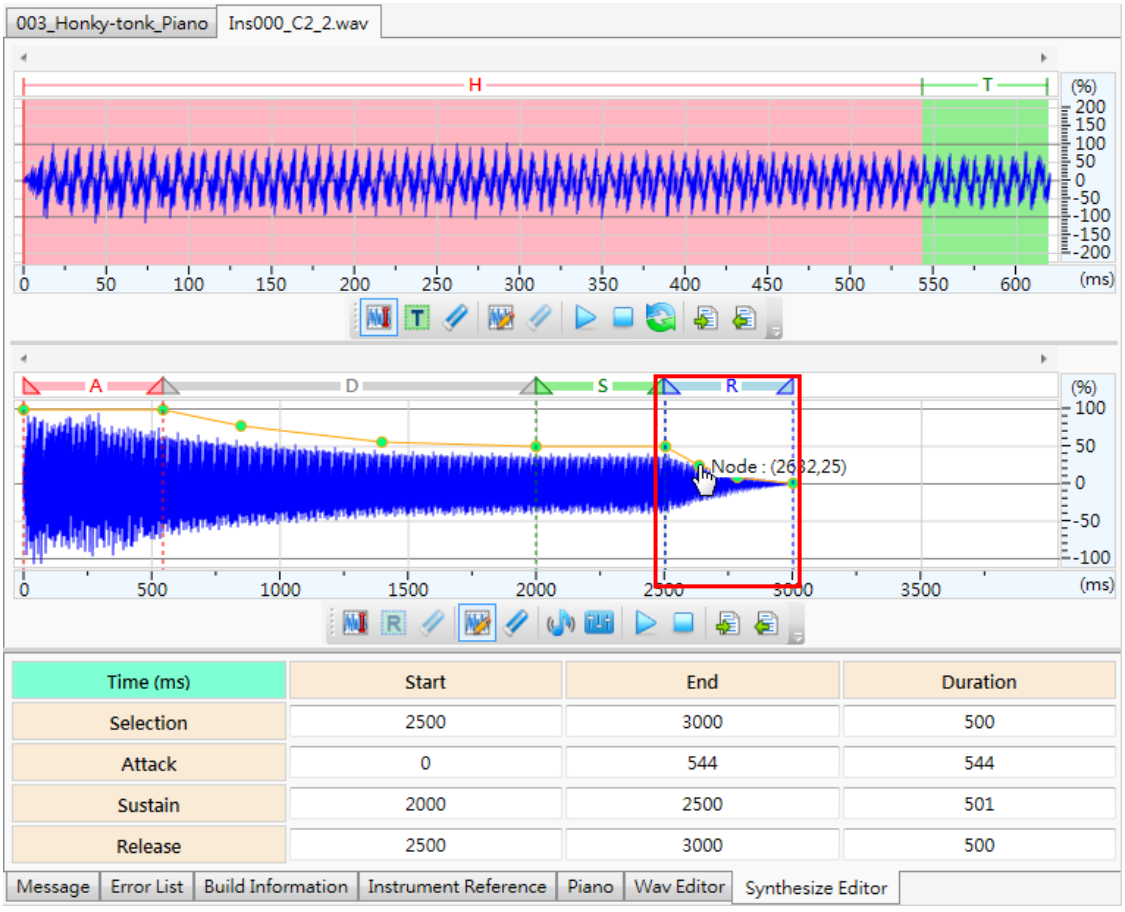
Message | Error List | Build Information | Instrument Reference | Piano | Wav Editor | Synthesize Editor

Step4 〉Move cursor to the Release section to add / remove / drag the envelope point for adjusting the envelope curve.

Add an envelope point: Move curosr to the desired position and press the left mouse button to add an envelope point.

Remove the envelope point: Move cursor to an envelope point and press the right button on mouse to delete the envelope point.

Drag the envelope point: Move cursor to the envelope point, pressing and holding the left mouse button until dragging the envelope point to the desired position.



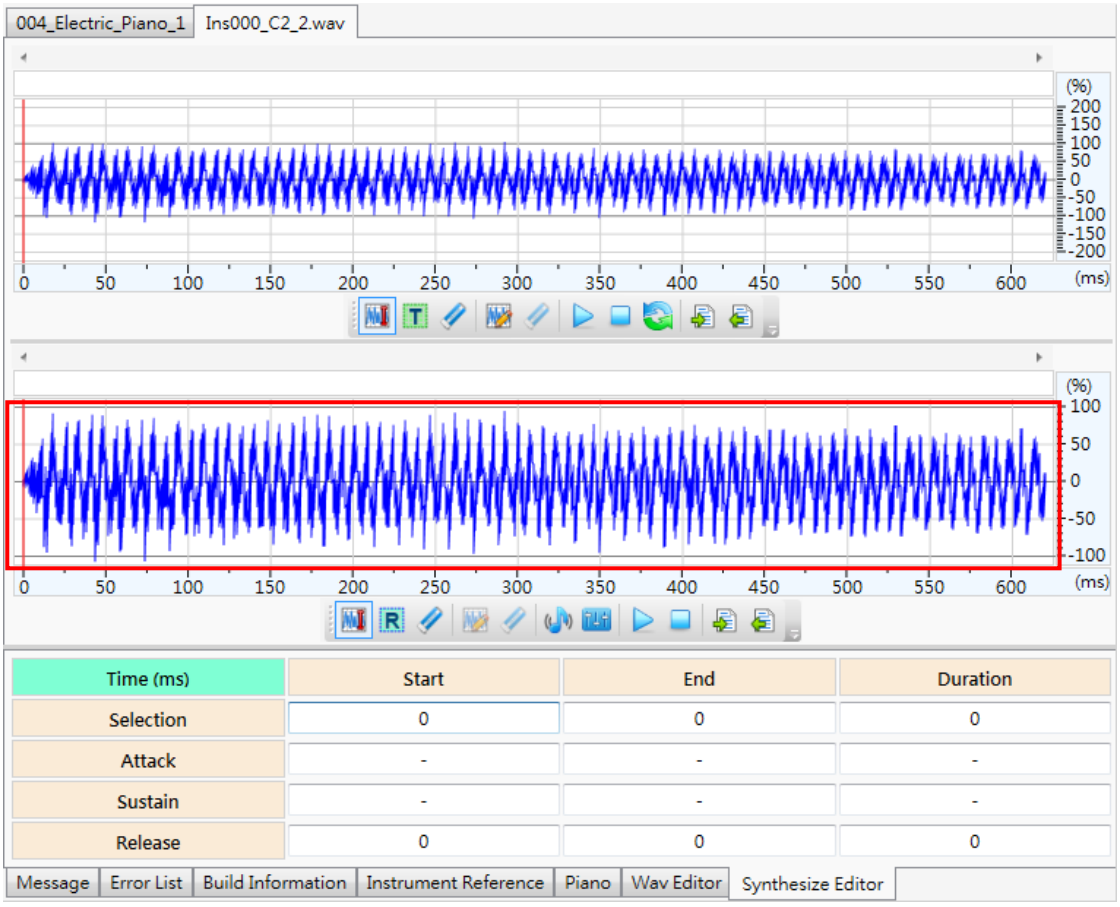
Time (ms)	Start	End	Duration
Selection	2500	3000	500
Attack	0	544	544
Sustain	2000	2500	501
Release	2500	3000	500

Message | Error List | Build Information | Instrument Reference | Piano | Wav Editor | Synthesize Editor

◆ Head Only: The entire wav source of Wav Editor is used to synthesizing sound. The procedure is described as follows.

● Set the Release section

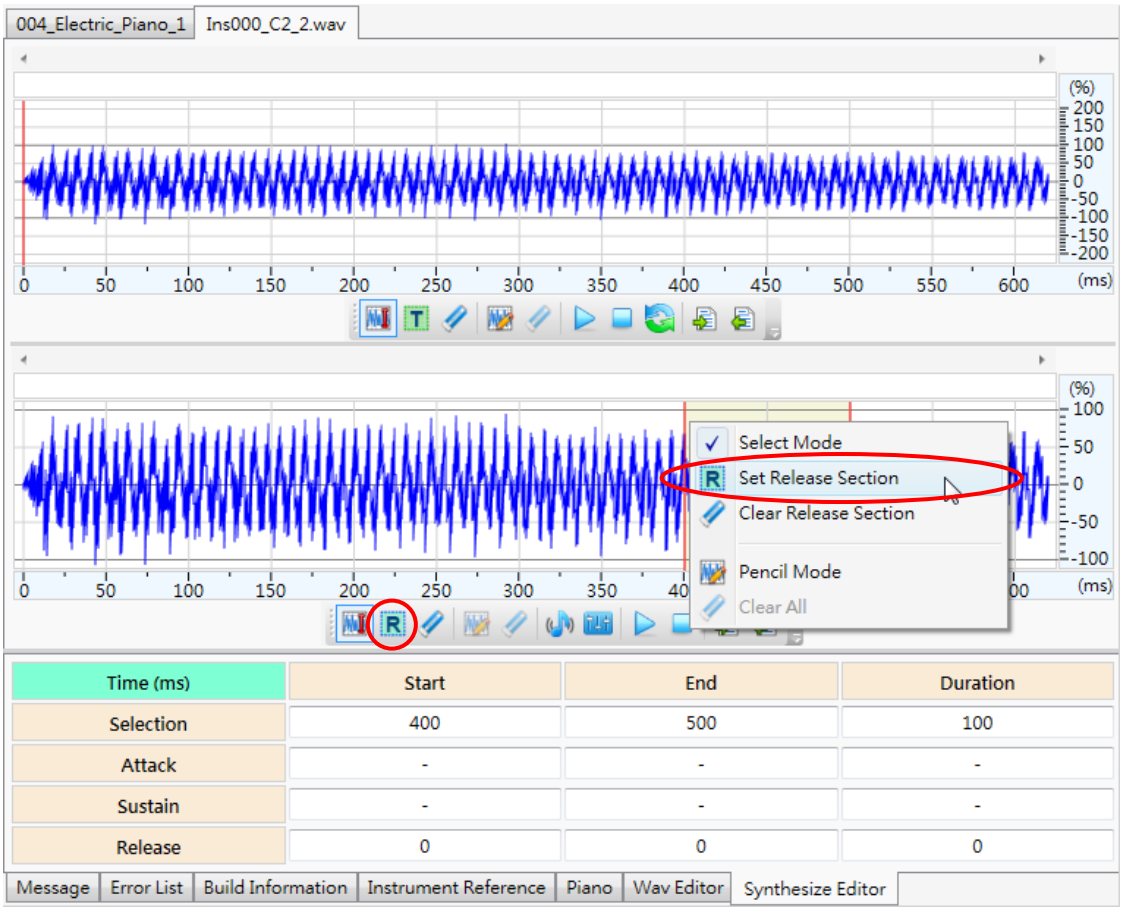
Step1 〉The Synthesize Editor shows the entire wav source from Wav Editor as synthesized result.



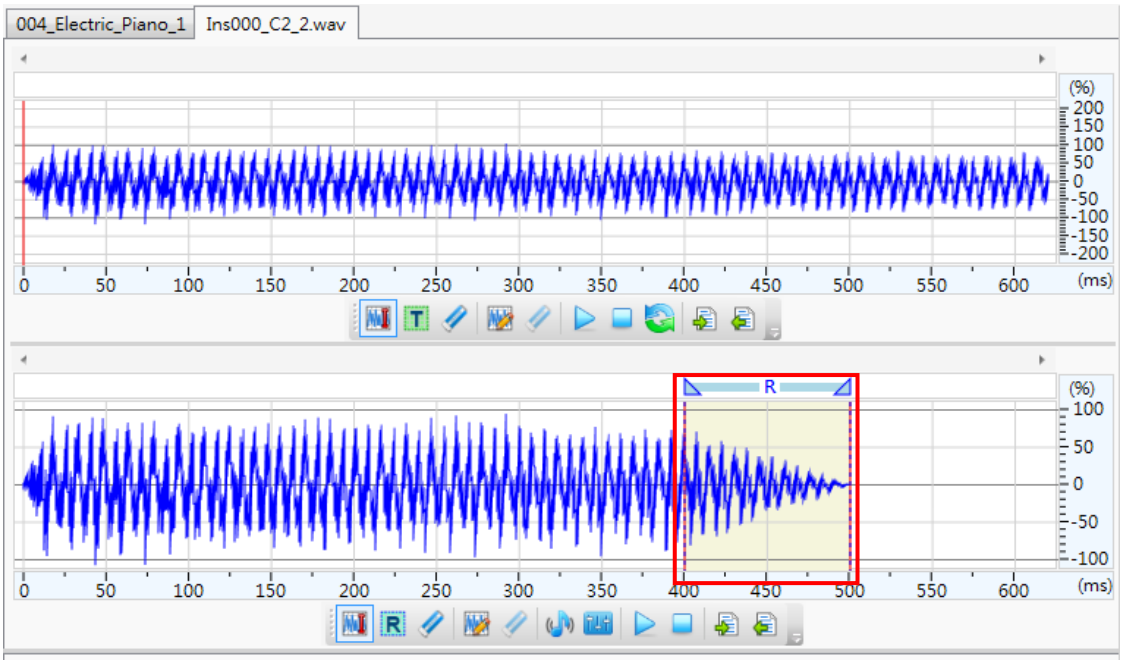
Time (ms)	Start	End	Duration
Selection	0	0	0
Attack	-	-	-
Sustain	-	-	-
Release	0	0	0

Message | Error List | Build Information | Instrument Reference | Piano | Wav Editor | Synthesize Editor

Step2 〉Select a range and set the Release section by toolbar or the context menu.



Step3 〉The Release section will be appeared after setting.

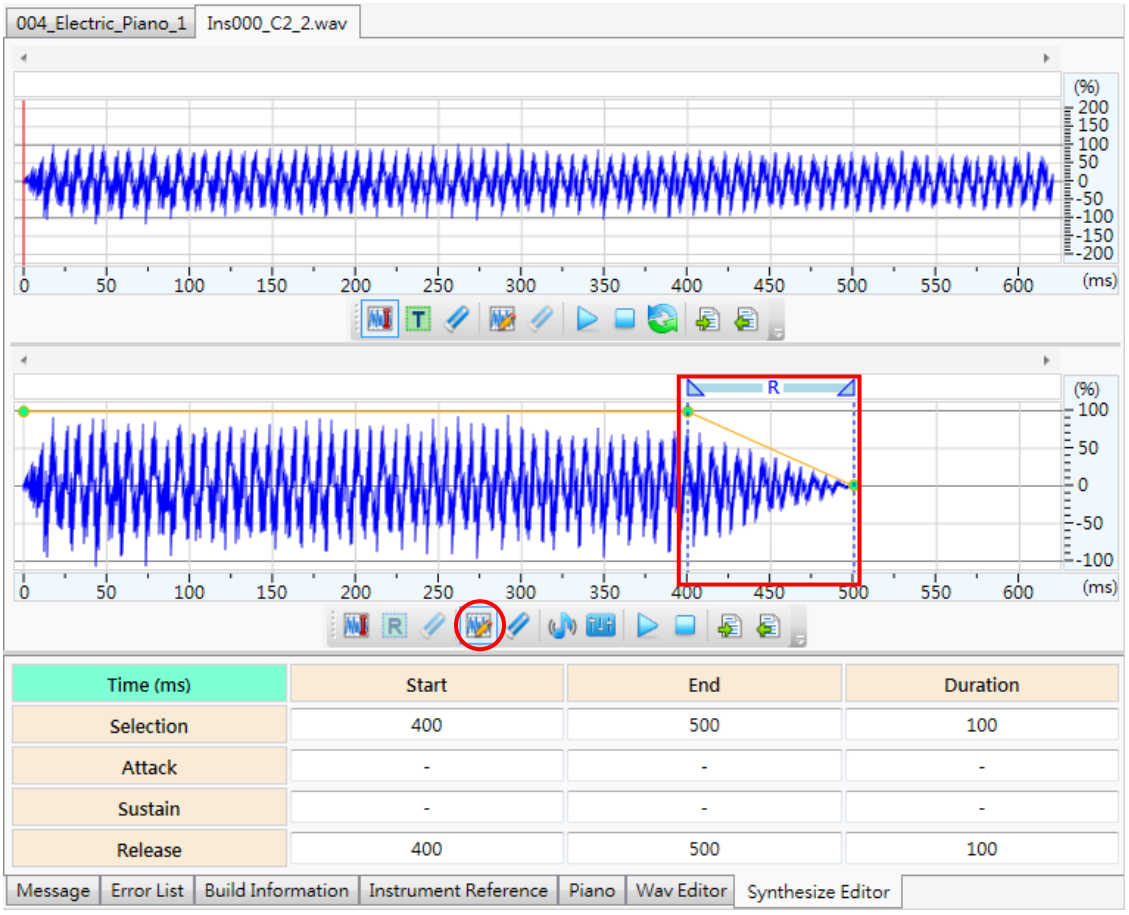


Time (ms)	Start	End	Duration
Selection	400	500	100
Attack	-	-	-
Sustain	-	-	-
Release	400	500	100

Message | Error List | Build Information | Instrument Reference | Piano | Wav Editor | Synthesize Editor

- Edit the envelope curve

  Step1 〉In pencil mode, move cursor to the Release section.



Time (ms)	Start	End	Duration
Selection	400	500	100
Attack	-	-	-
Sustain	-	-	-
Release	400	500	100

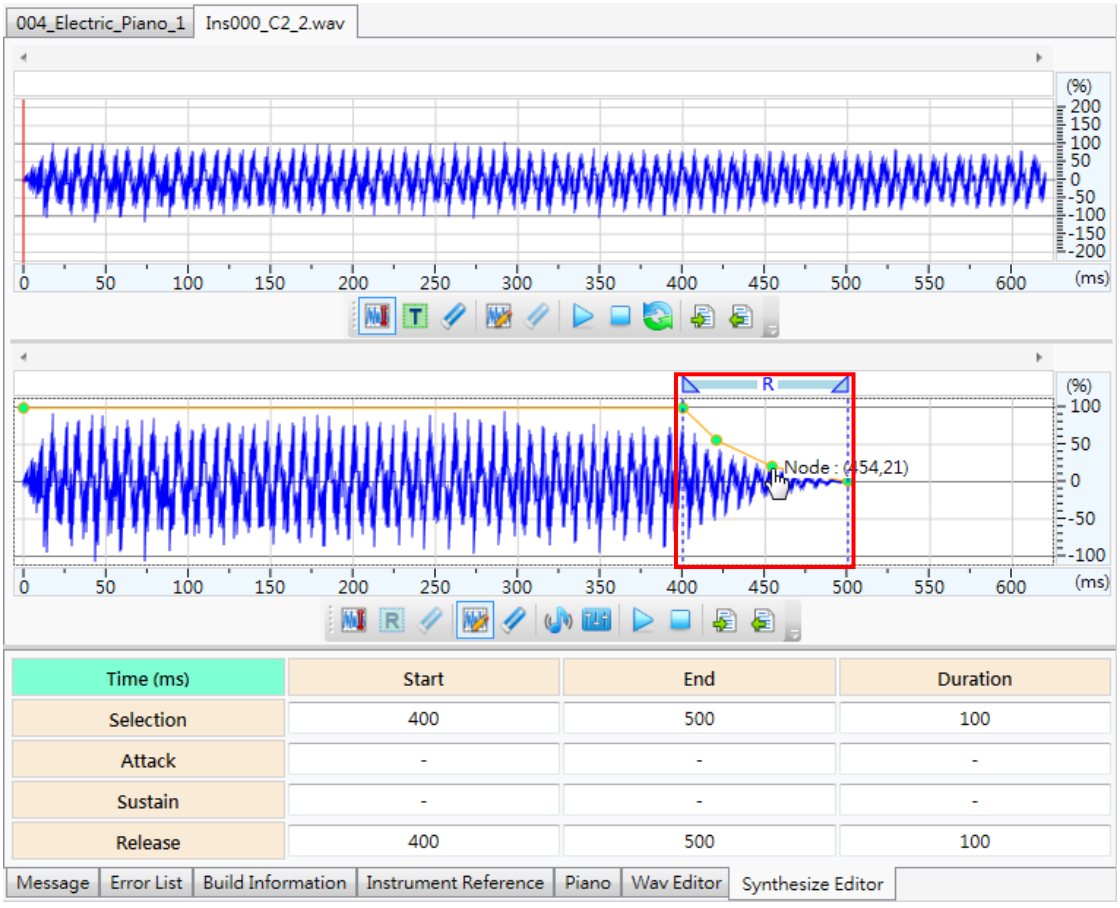
Message | Error List | Build Information | Instrument Reference | Piano | Wav Editor | Synthesize Editor

Step2 〉Use cursor to add / remove / drag the envelope point for adjusting the envelope curve in the Release section.

Add an envelope point: Move curosr to the desired position and press the left mouse button to add an envelope point.

Remove the envelope point: Move cursor to an envelope point and press the right button on mouse to delete the envelope point.

Drag the envelope point: Move cursor to the envelope point, press and hold the left mouse button until dragging the envelope point to the desired position.



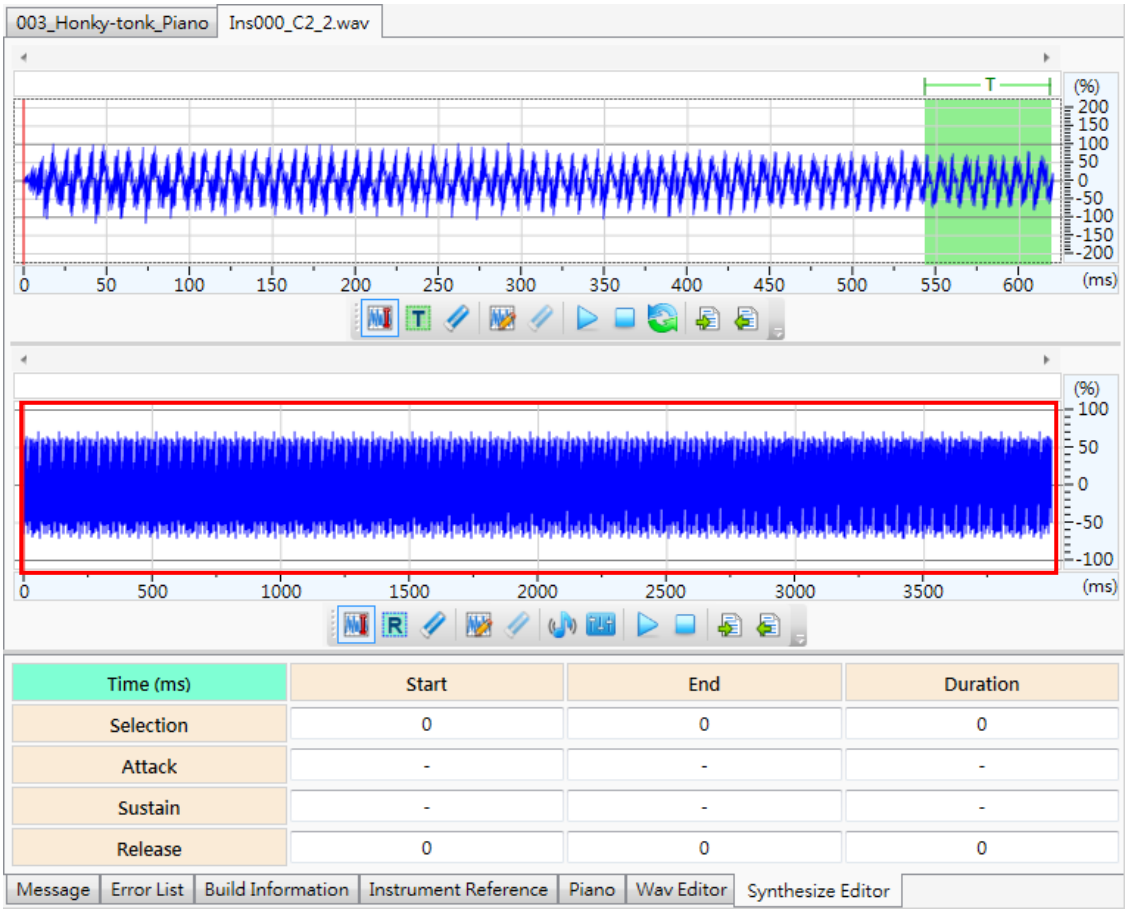
Time (ms)	Start	End	Duration
Selection	400	500	100
Attack	-	-	-
Sustain	-	-	-
Release	400	500	100

Message | Error List | Build Information | Instrument Reference | Piano | Wav Editor | Synthesize Editor

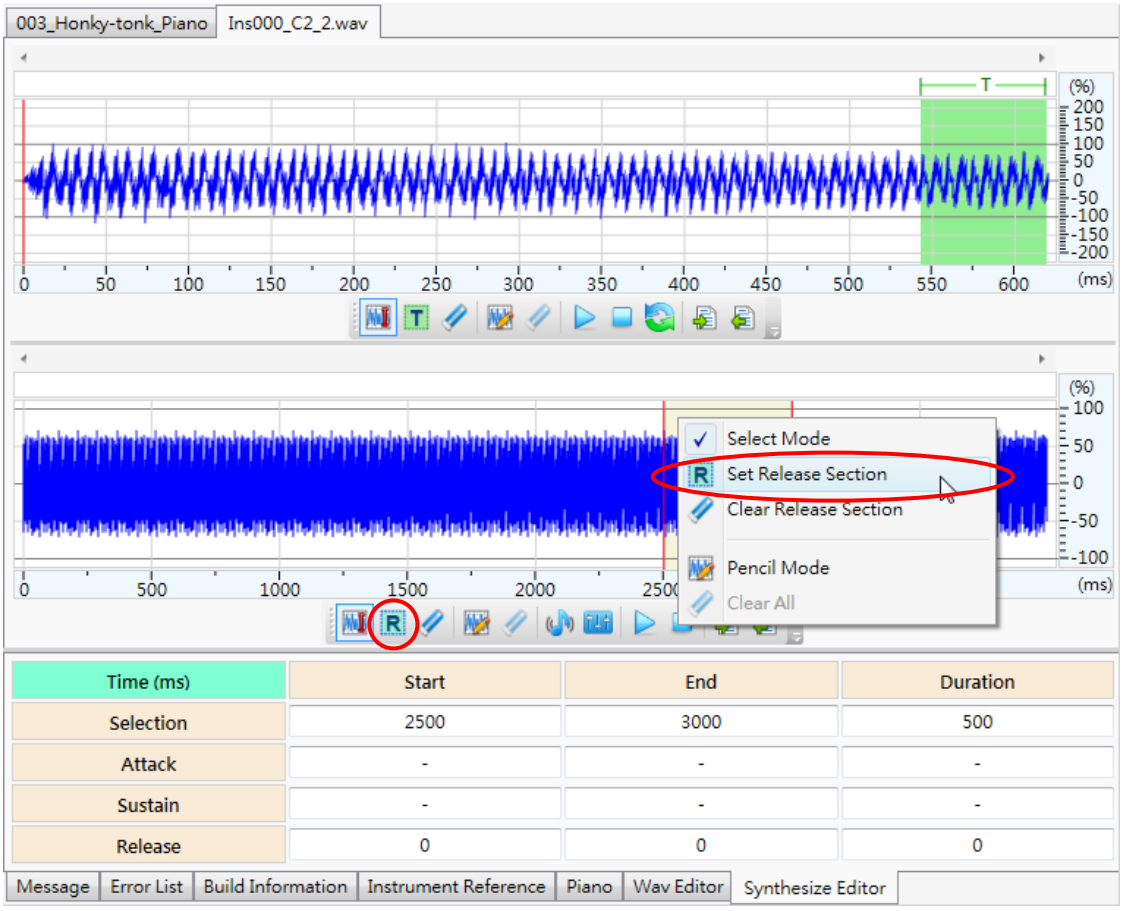
◆ Tail Only: The synthesized wav is created by repeating Tail sections in the Wav Editor.

● Set the Release section

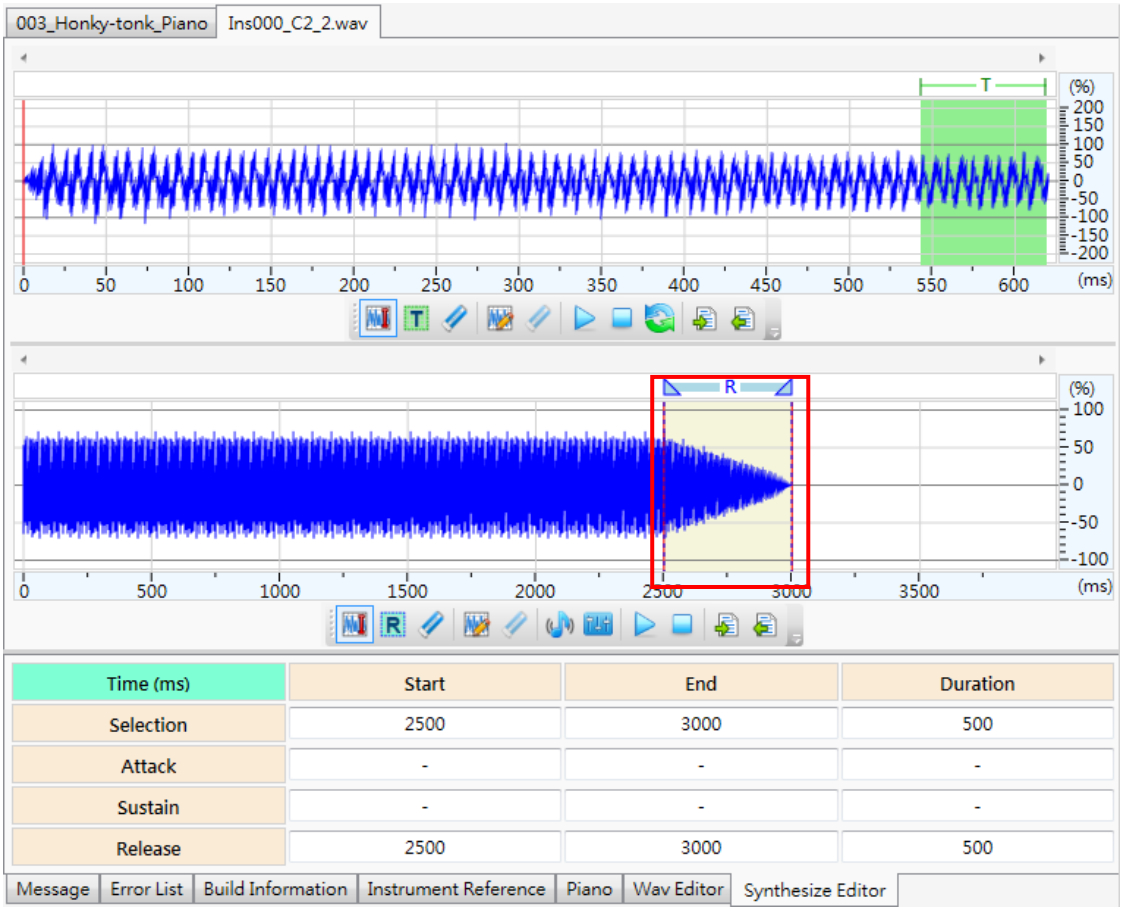
Step1 〉Set the mode as Tail Only in the Synthesize Editor.



Step2 〉Select a range and set the Release section by toolbar or the context menu.



Step3 〉The Release section will be appeared after setting.



Time (ms)	Start	End	Duration
Selection	2500	3000	500
Attack	-	-	-
Sustain	-	-	-
Release	2500	3000	500

Message | Error List | Build Information | Instrument Reference | Piano | Wav Editor | Synthesize Editor

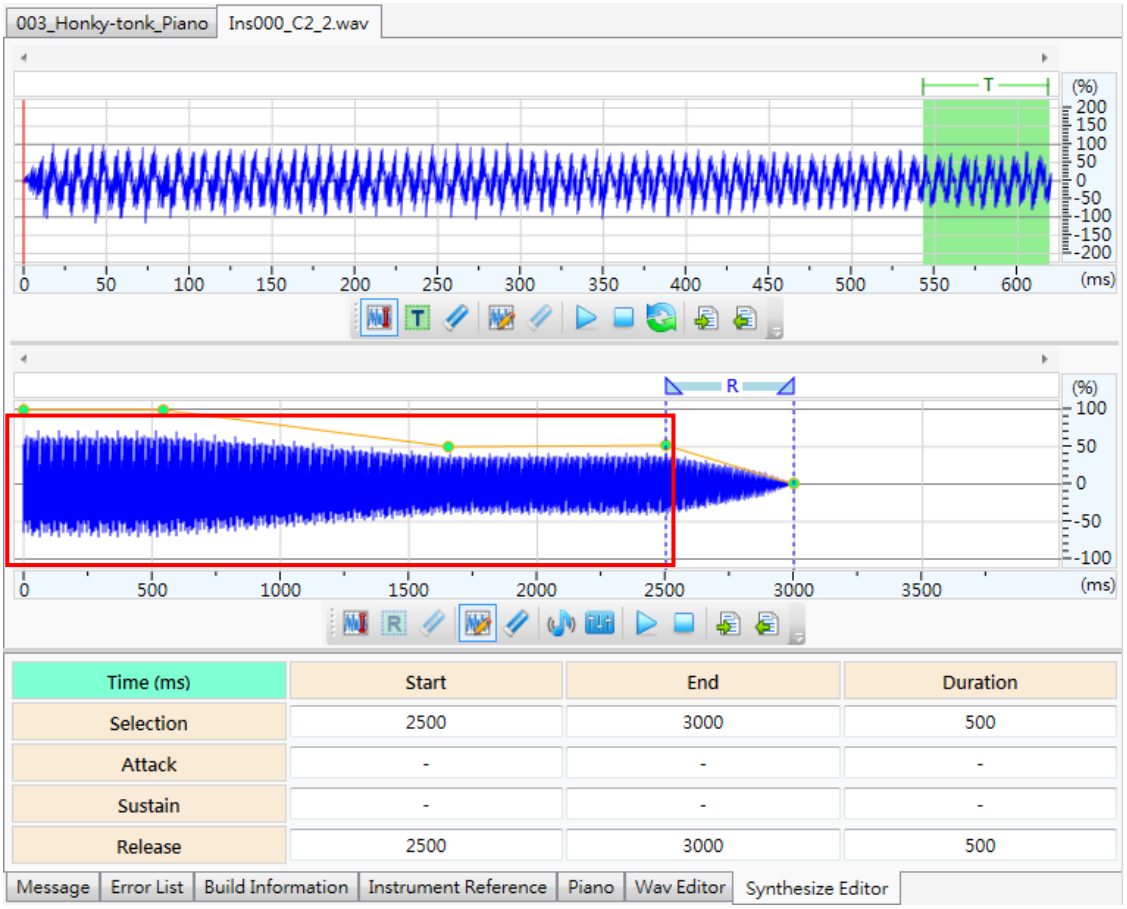
- Edit the envelope curve

  Step1 〉In pencil mode, use cursor to add / remove / drag the envelope point for adjusting the envelope curve

  Add an envelope point: Move curosr to the desired position and press the left mouse button to add an envelope point.

  Remove the envelope point: Move cursor to an envelope point and press the right button on mouse to delete the envelope point.

  Drag the envelope point: Move cursor to the envelope point, press and hold the left mouse button until dragging the envelope point to the desired position.

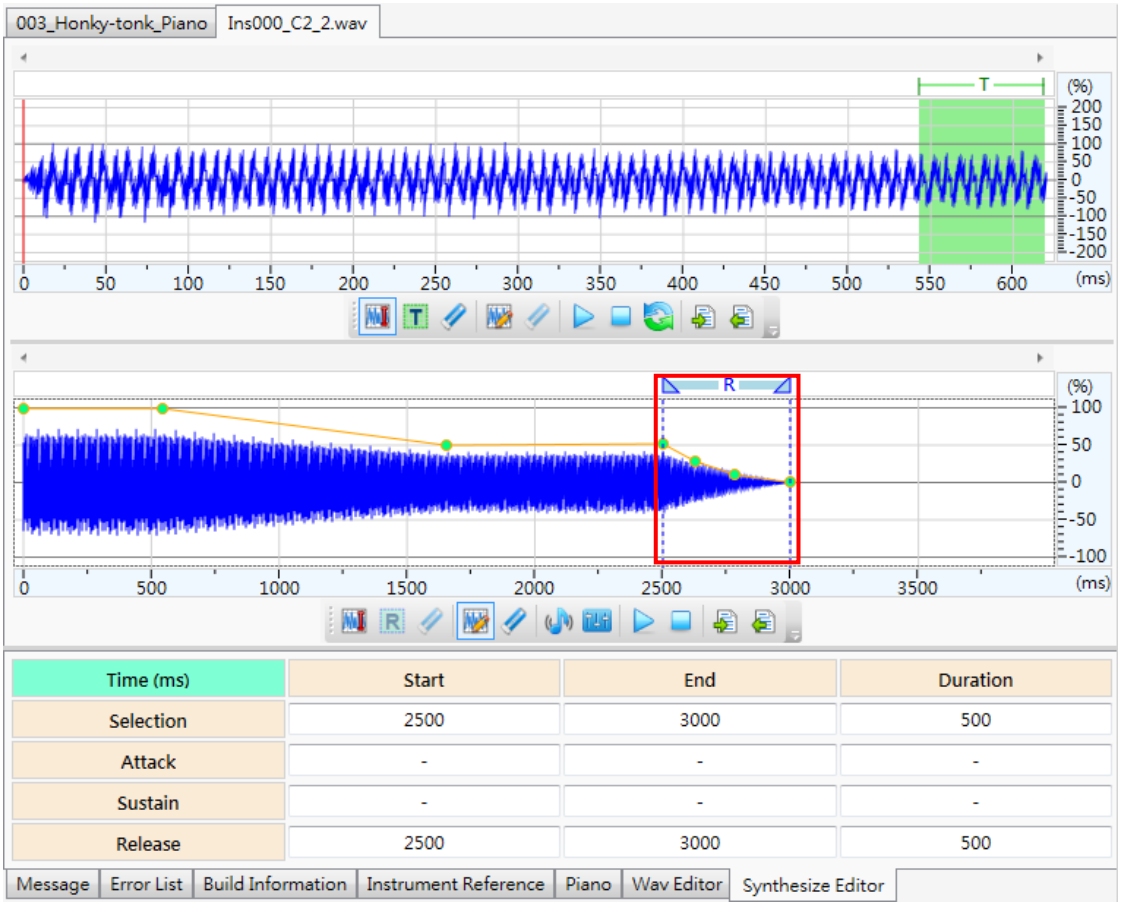


Step2 〉Use cursor to add / remove / drag the envelope point for adjusting the envelope curve in the Release section

Add an envelope point: Move curosr to the desired position and press the left mouse button to add an envelope point.

Remove the envelope point: Move cursor to an envelope point and press the right button on mouse to delete the envelope point.

Drag the envelope point: Move cursor to the envelope point, pressing and holding the left mouse button until dragging the envelope point to the desired position.

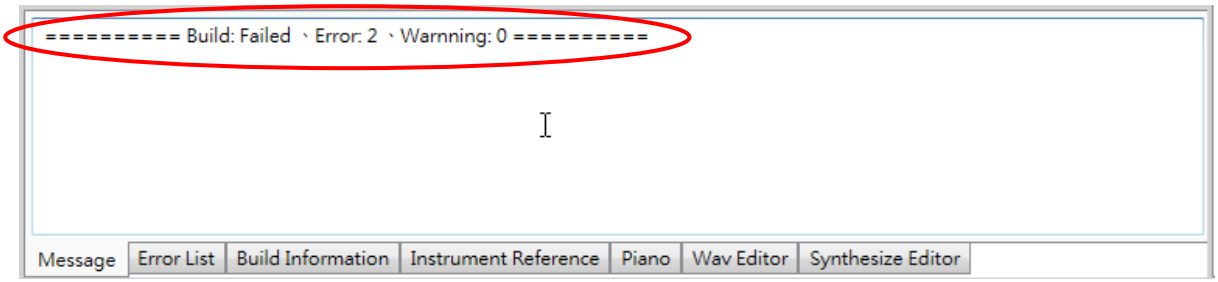


2.8 Information Window

The Information Window includes tabs of Message, Error List, Build Information, Instrument Reference, Piano, Wav Editor and Synthesize Editor.

2.8.1 Message

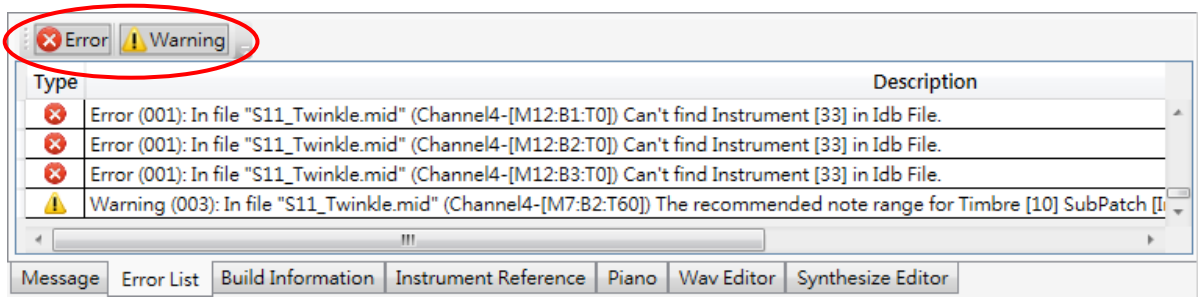
After Convert, Download and Export Resources functions are executed, the Message tab will show the status of build, and the number of errors and warning.



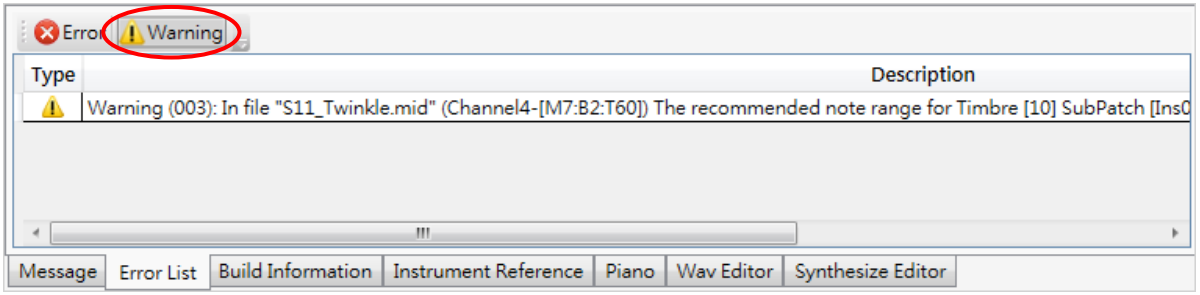
2.8.2 Error List

After Convert, Download and Export Resources functions are executed, the Error List tab will show the information of warning and error. User can click the button on toolbar to filter message types.

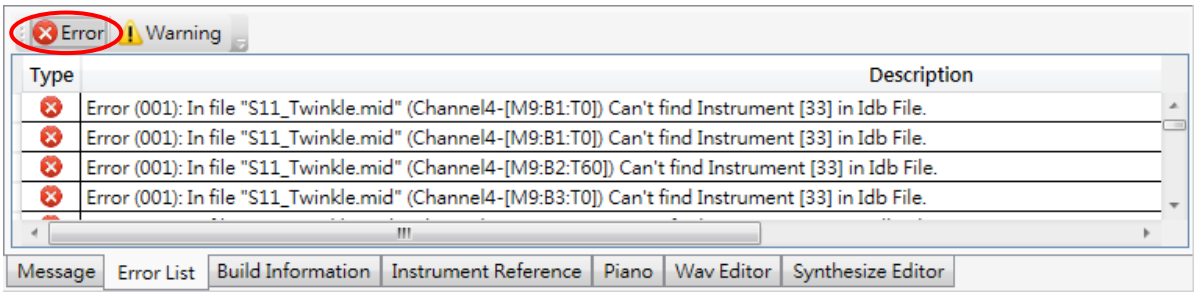
◆ **Shows all information**


Error
Warning
Type
Description
Error (001): In file "S11_Twinkle.mid" (Channel4-[M12:B1:T0]) Can't find Instrument [33] in Idb File.
Error (001): In file "S11_Twinkle.mid" (Channel4-[M12:B2:T0]) Can't find Instrument [33] in Idb File.
Error (001): In file "S11_Twinkle.mid" (Channel4-[M12:B3:T0]) Can't find Instrument [33] in Idb File.
Warning (003): In file "S11_Twinkle.mid" (Channel4-[M7:B2:T60]) The recommended note range for Timbre [10] SubPatch
Message
Error List
Build Information
Instrument Reference
Piano
Wav Editor
Synthesize Editor

◆ **Warning information only**



◆ **Error information only**

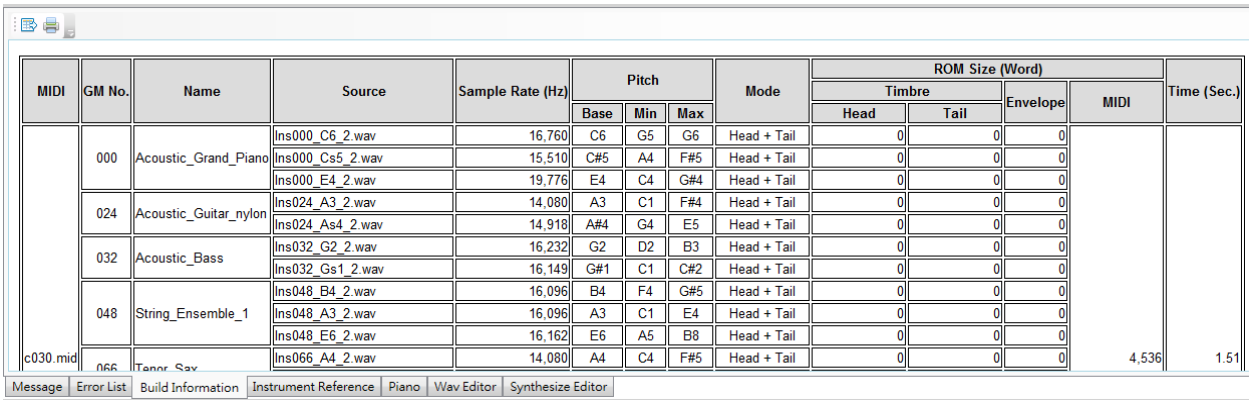

Error
Warning
Type
Description
Error (001): In file "S11_Twinkle.mid" (Channel4-[M9:B1:T0]) Can't find Instrument [33] in Idb File.
Error (001): In file "S11_Twinkle.mid" (Channel4-[M9:B1:T0]) Can't find Instrument [33] in Idb File.
Error (001): In file "S11_Twinkle.mid" (Channel4-[M9:B2:T60]) Can't find Instrument [33] in Idb File.
Error (001): In file "S11_Twinkle.mid" (Channel4-[M9:B3:T0]) Can't find Instrument [33] in Idb File.
Message
Error List
Build Information
Instrument Reference
Piano
Wav Editor
Synthesize Editor

2.8.3 Build Information

The Build Information tab shows the subpatches information used by .mid files in the current project. User can export or print the information by using toolbar.

Export: Export the content of the Build Information and save as .html file.

Print: Print the content of the Build Information.



MIDI	GM No.	Name	Source	Sample Rate (Hz)	Pitch			Mode	ROM Size (Word)				Time (Sec.)
					Base	Min	Max		Timbre		Envelope	MIDI	
									Head	Tail			
	000	Acoustic_Grand_Piano	Ins000_C6_2.wav	16,760	C6	G5	G6	Head + Tail	0	0	0		
			Ins000_Cs5_2.wav	15,510	C#5	A4	F#5	Head + Tail	0	0	0		
			Ins000_E4_2.wav	19,776	E4	C4	G#4	Head + Tail	0	0	0		
	024	Acoustic_Guitar_nylon	Ins024_A3_2.wav	14,080	A3	C1	F#4	Head + Tail	0	0	0		
			Ins024_As4_2.wav	14,918	A#4	G4	E5	Head + Tail	0	0	0		
	032	Acoustic_Bass	Ins032_G2_2.wav	16,232	G2	D2	B3	Head + Tail	0	0	0		
			Ins032_Gs1_2.wav	16,149	G#1	C1	C#2	Head + Tail	0	0	0		
	048	String_Ensemble_1	Ins048_B4_2.wav	16,096	B4	F4	G#5	Head + Tail	0	0	0		
			Ins048_A3_2.wav	16,096	A3	C1	E4	Head + Tail	0	0	0		
			Ins048_E6_2.wav	16,162	E6	A5	B8	Head + Tail	0	0	0		
c030.mid	066	Tenor_Sax	Ins066_A4_2.wav	14,080	A4	C4	F#5	Head + Tail	0	0	0	4,536	1.51

Message | Error List | Build Information | Instrument Reference | Piano | Wav Editor | Synthesize Editor

Each column is described as follows.

MIDI: The filename of .mid file.

GM No.: The number of instrument.

Name: The instrument name.

Source: The wav source.

Sample Rate (Hz): The sample rate of wav source.

Pitch–Base: The base pitch.

Pitch–Min: The minimum pitch.

Pitch–Max: The maximum pitch.

Mode: The synthesize mode includes Head + Tail, Head Only and Tail Only.

Timbre–Head: The occupied ROM size of the Head section, the unit is word.

Timbre–Tail: The occupied ROM size of the Tail section, the unit is word.

Envelope: The occupied ROM size of the envelope curve, the unit is word.

MIDI: The occupied ROM size of the converted .mid file, the unit is word.

Time: The occupied demo time of the converted .mid file, the unit is second.

	ROM Size (Word)	Time (Sec.)
Timbre	92,148	30.72
MIDI	28,692	9.56
Timbre & MIDI	120,840	40.28

Each column is described as follows.

ROM Size (Word)：The ROM size of Timbre, MIDI and Timbre & MIDIM. The unit is Word.

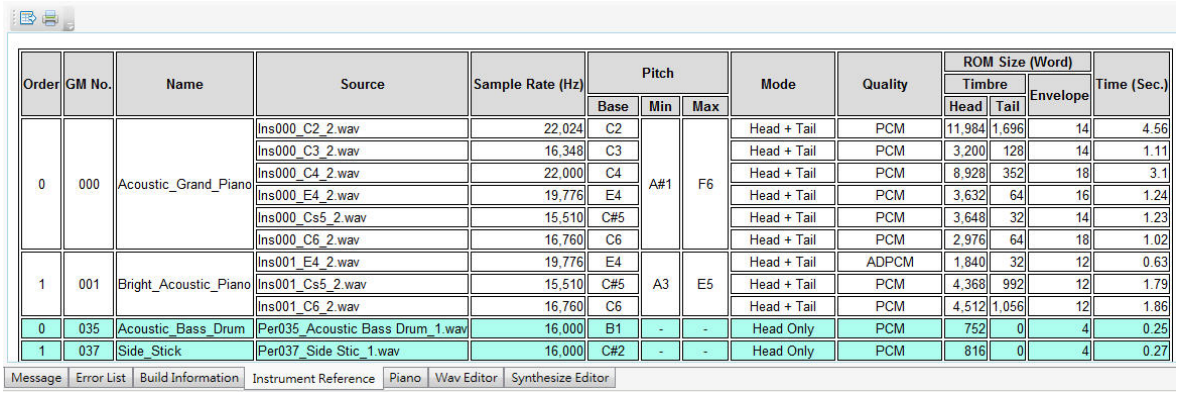
Time (Sec.)：The Time length of Timbre, MIDI and Timbre & MIDI. The unit is Second.

2.8.4 Instrument Reference

The Instrument Reference tab shows the information of the used instruments of selected .mid file. User can export or print the content by toolbar.

Export: Export the content of the Instrument Reference and save as .html file.

Print: Print the content of the Instrument Reference.



Order	GM No.	Name	Source	Sample Rate (Hz)	Pitch			Mode	Quality	ROM Size (Word)			Time (Sec.)
					Base	Min	Max			Timbre		Envelope	
										Head	Tail		
0	000	Acoustic_Grand_Piano	Ins000_C2_2.wav	22,024	C2	A#1	F6	Head + Tail	PCM	11,984	1,696	14	4.56
			Ins000_C3_2.wav	16,348	C3			Head + Tail	PCM	3,200	128	14	1.11
			Ins000_C4_2.wav	22,000	C4			Head + Tail	PCM	8,928	352	18	3.1
			Ins000_E4_2.wav	19,776	E4			Head + Tail	PCM	3,632	64	16	1.24
			Ins000_Cs5_2.wav	15,510	C#5			Head + Tail	PCM	3,648	32	14	1.23
			Ins000_C6_2.wav	16,760	C6			Head + Tail	PCM	2,976	64	18	1.02
1	001	Bright_Acoustic_Piano	Ins001_E4_2.wav	19,776	E4	A3	E5	Head + Tail	ADPCM	1,840	32	12	0.63
			Ins001_Cs5_2.wav	15,510	C#5			Head + Tail	PCM	4,368	992	12	1.79
			Ins001_C6_2.wav	16,760	C6			Head + Tail	PCM	4,512	1,056	12	1.86
0	035	Acoustic_Bass_Drum	Per035_Acoustic Bass Drum_1.wav	16,000	B1	-	-	Head Only	PCM	752	0	4	0.25
1	037	Side_Stick	Per037_Side Stic_1.wav	16,000	C#2	-	-	Head Only	PCM	816	0	4	0.27

Message | Error List | Build Information | Instrument Reference | Piano | Wav Editor | Synthesize Editor

Each column is described as follows.

Order: The sequential number.

GM No. : The number of instrument.

Name: The instrument name.

Source: The wav source.

Sample Rate (Hz): The sample rate of wav source.

Pitch–Base: The base pitch.

Pitch–Min: The minimum pitch.

Pitch–Max: The maximum pitch.

Mode: The synthesize mode includes Head + Tail, Head Only and Tail Only.

Quality: The quality of subpatch includes ADPCM and PCM.

Timbre–Head: The occupied ROM size of the Head section, the unit is word.

Timbre–Tail: The occupied ROM size of the Tail section, the unit is word.

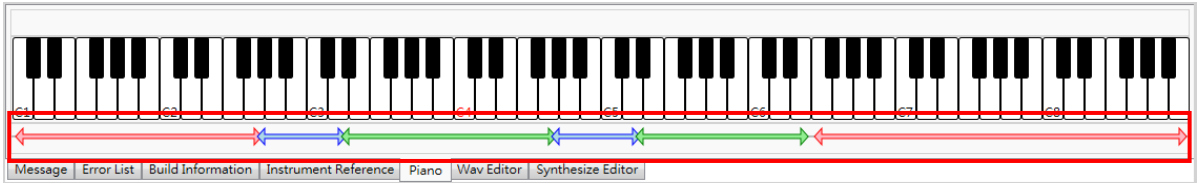
Envelope: The occupied ROM size of the envelope curve, the unit is word.

Time: The occupied ROM of the subpatch caculated as 6K sampling rate for IC, the unit is second.

2.8.5 Piano

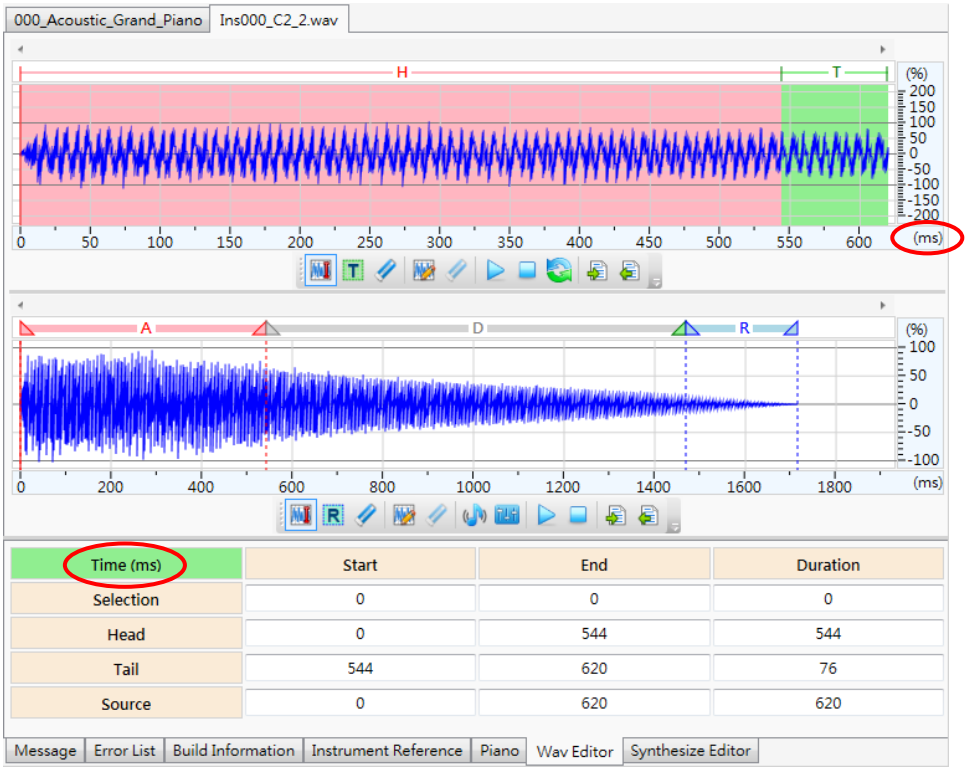
User can edit the pitch range of all subpatches of a specified instrument and playback each of the synthesized pitch in this area.

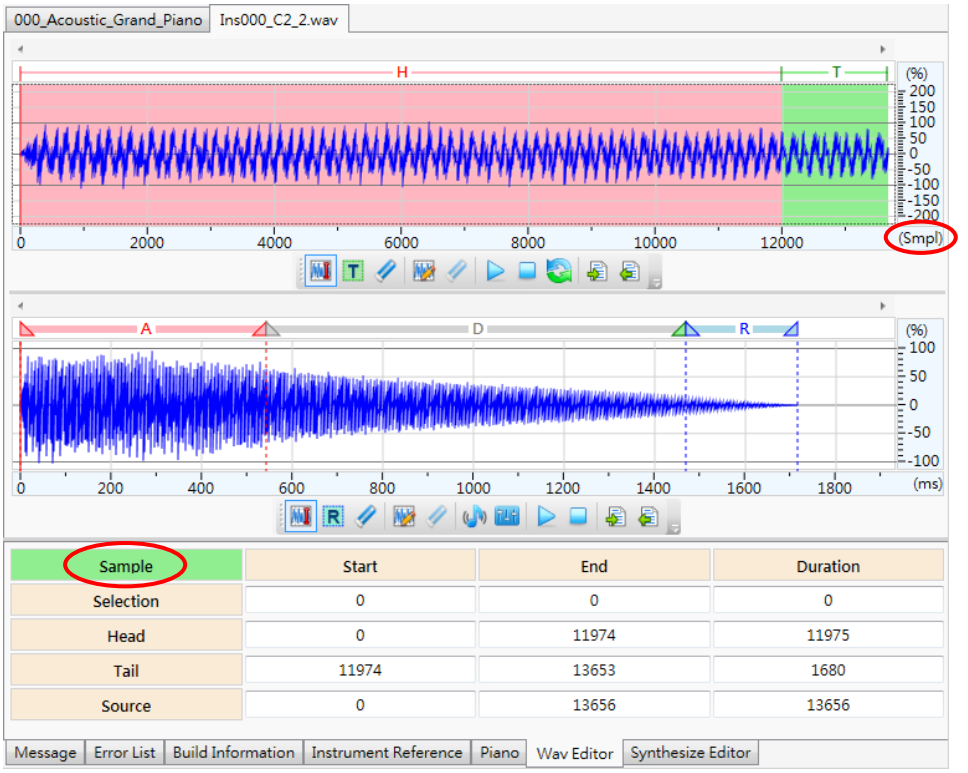
The following example illustrated there are 6 subpatches in this specified instrument. User can press on the piano key to listen to the synthesized result.



2.8.6 Wav Editor

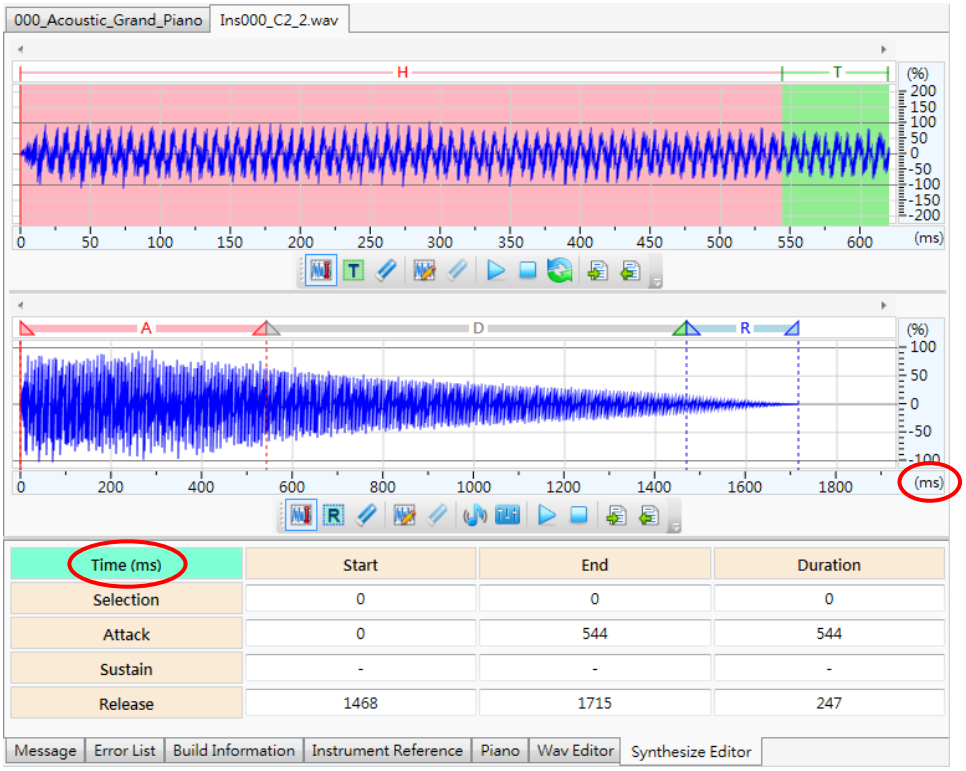
The Wav Editor shows basic information of Selection, Head, Tail and Source. The unit can be ms or sample by double clicking the left mouse button on the horizontal ruler.





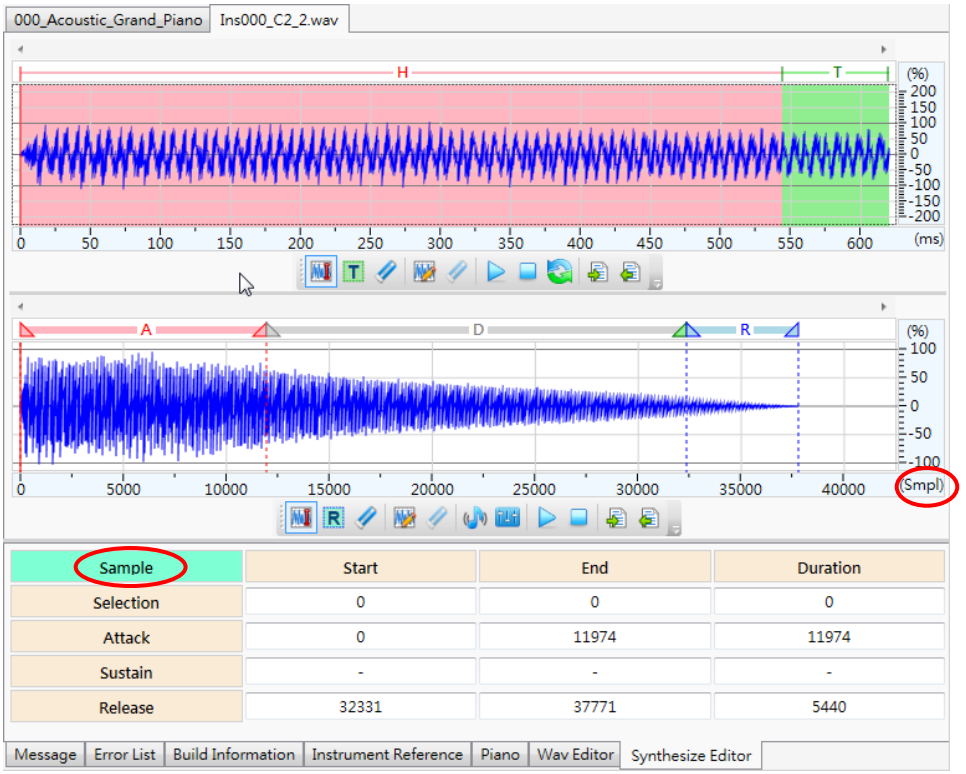
2.8.7 Synthesize Editor

The Synthesize Editor area shows the basic information of Selection, Attack, Sustain and Release. The unit can be ms or sample by double clicking the left mouse button on the horizontal ruler.



Time (ms)	Start	End	Duration
Selection	0	0	0
Attack	0	544	544
Sustain	-	-	-
Release	1468	1715	247

Message | Error List | Build Information | Instrument Reference | Piano | Wav Editor | Synthesize Editor

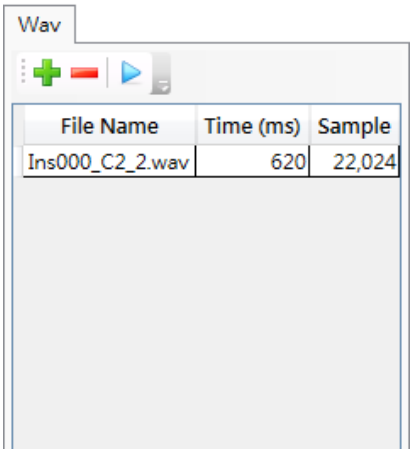


Sample	Start	End	Duration
Selection	0	0	0
Attack	0	11974	11974
Sustain	-	-	-
Release	32331	37771	5440

Message | Error List | Build Information | Instrument Reference | Piano | Wav Editor | Synthesize Editor

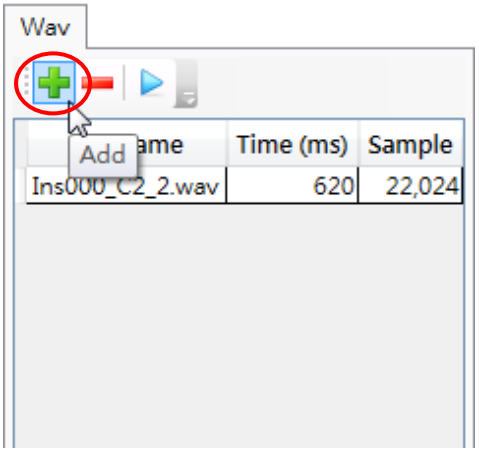
2.9 Wav Manager

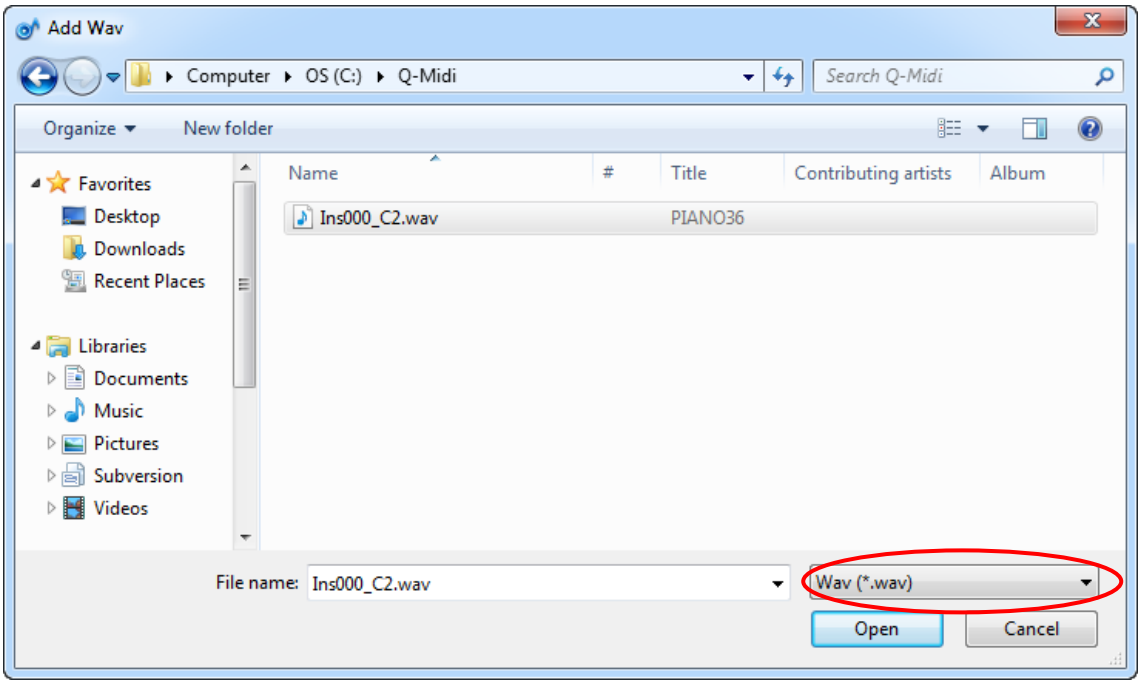
The Wav Manager contains the wav sources of instrument database. User can add / delete / play the file by the toolbar.



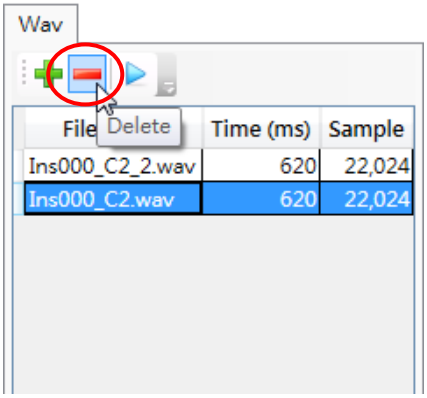
The descriptions of toolbar are as follows.

Add: Add the desired wav source file, the supported file type is .wav.

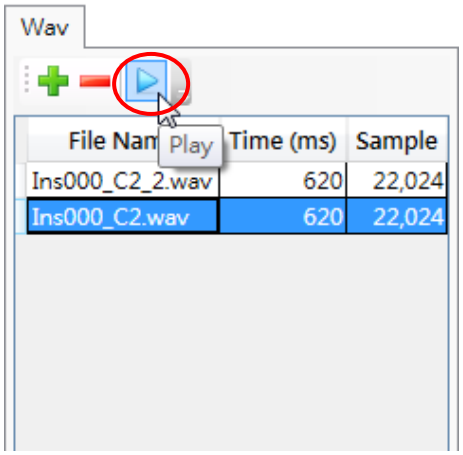




Delete: Delete the current selected wav source.



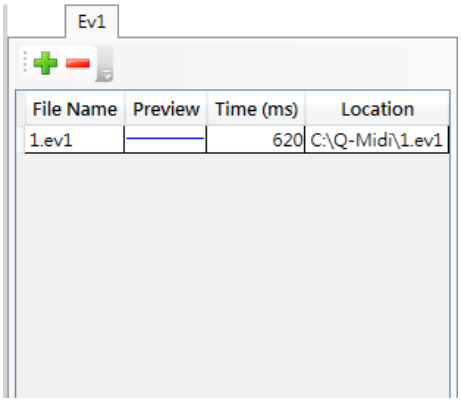
Play: Play the current selected wav source.



2.10 Envelope Editor

The Envelope Editor has 2 tabs: Ev1 and Ev2. The Ev1 tab stores the envelope files of Wav Editor, whereas the Ev2 tab stores the envelope files of Synthesize Editor.

◆ **Ev1 Manager**



Each column is described as follows.

File Name: The filename of envelope.

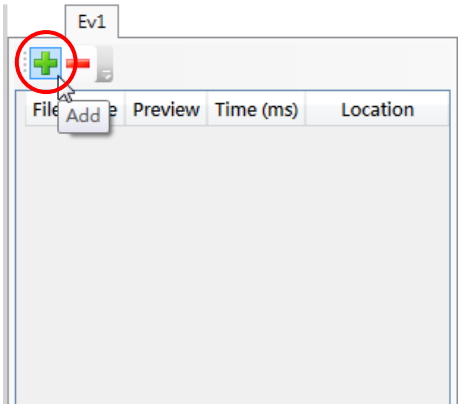
Preview: Preview the waveform of envelope.

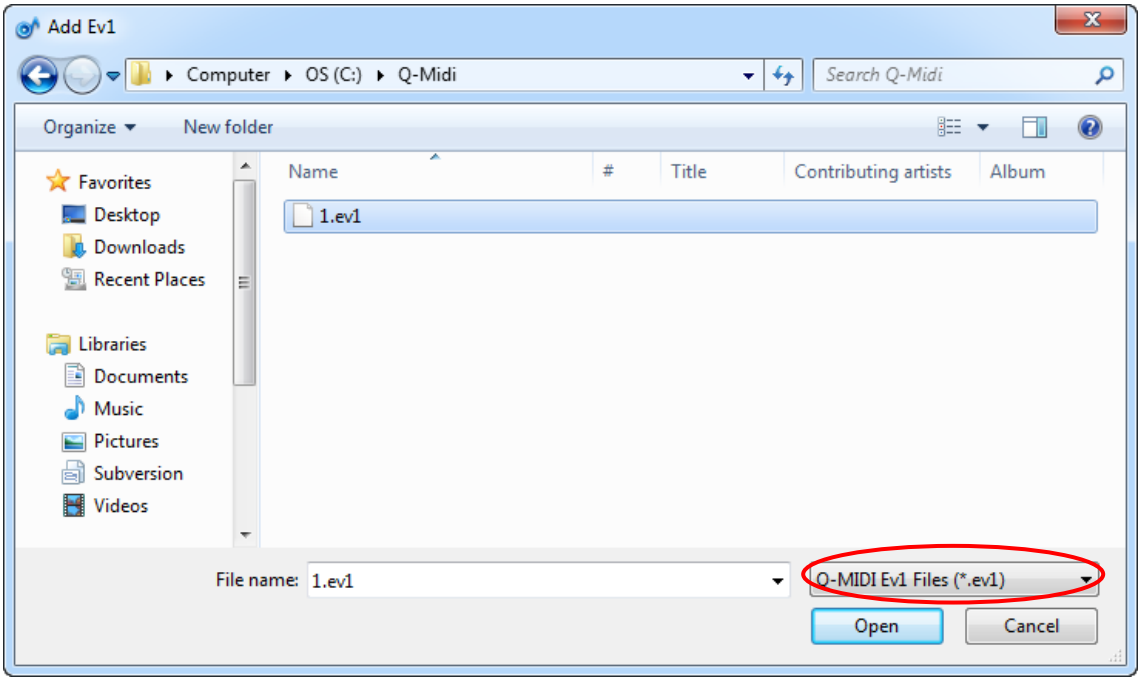
Time: The time length of envelope, the unit is ms.

Location: The file path of envelope.

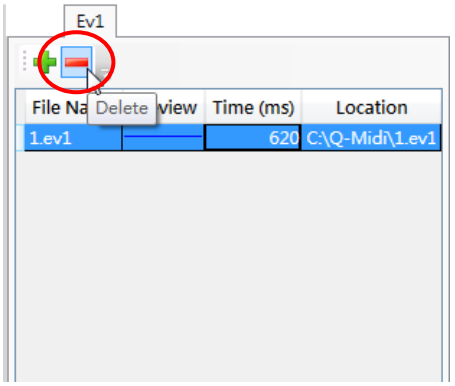
The descriptions of tool bar are as follows.

Add: Add an envelope file, and its file extension is .ev1.

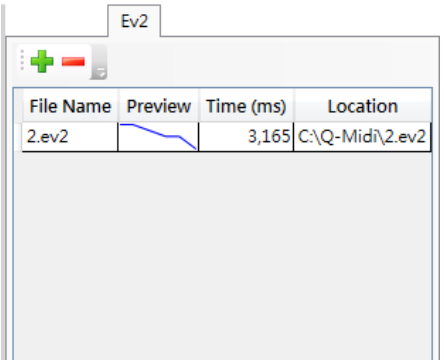




Delete: Delete the current selected envelope file.



◆ **Ev2 Manager**



Each column is described as follows.

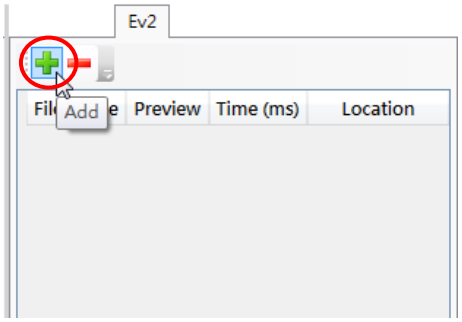
File Name: The filename of envelope.

Preview: Preview the waveform of envelope.

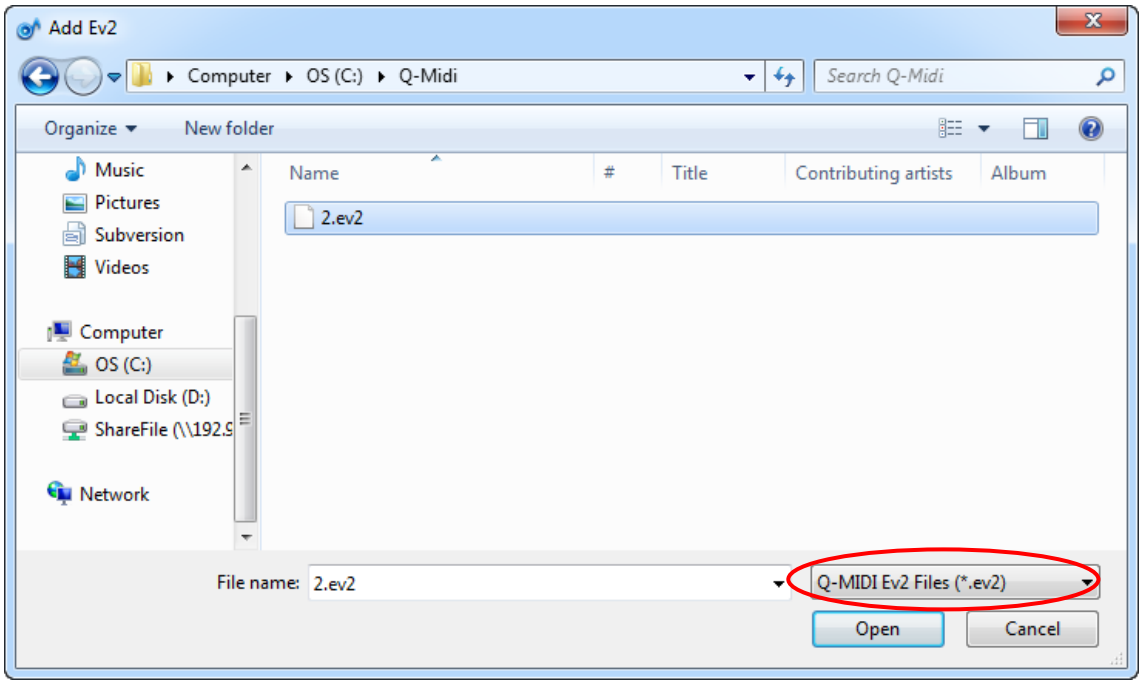
Time: The time length of envelope, the unit is ms.

Location: The file path of envelope.

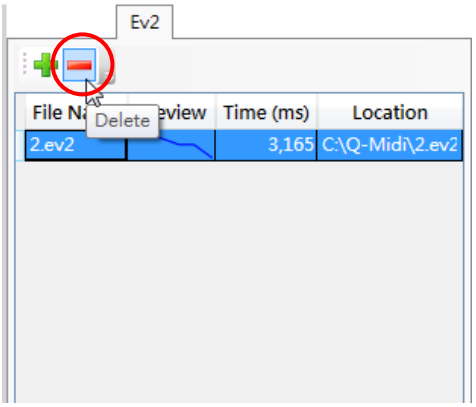
The descriptions of tool bar are as follows.



Add: Add an envelope file, and its filename extension is .ev2



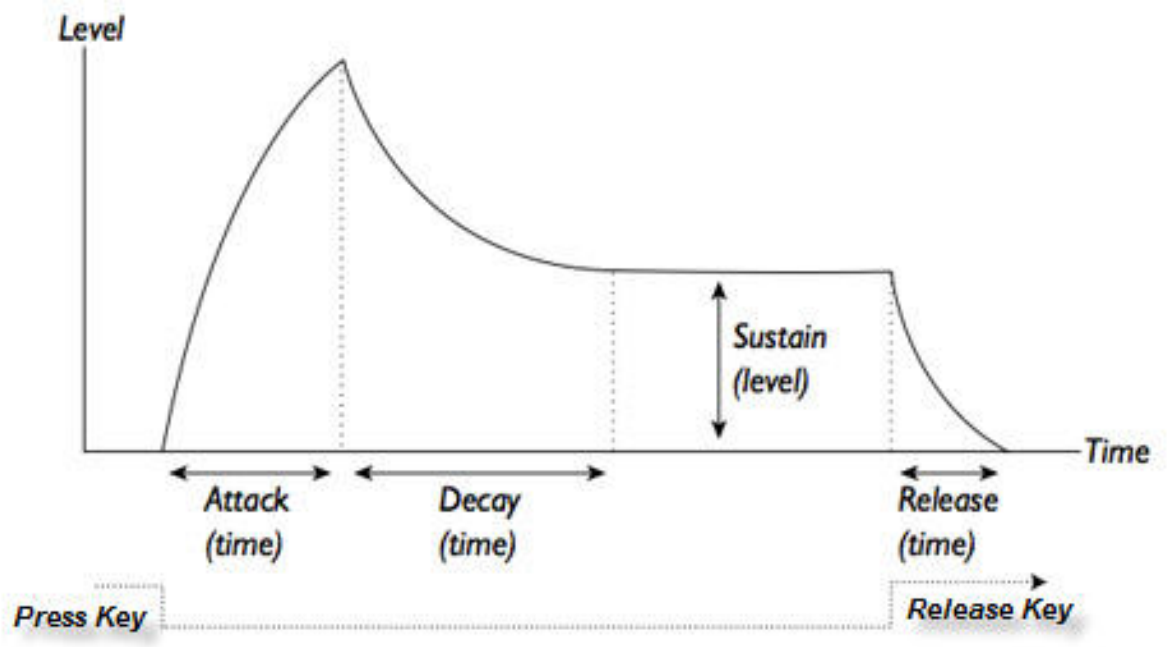
Delete: Delete the current selected envelope file.



3 Appendix

3.1 ADSR Section

The following illustration and description is taking the example of the pressed and released key.



Attack: The attack time is the duration when the key is pressed, the sound runs up to peak.

Decay: The decay time is the duration when the sound subsequently runs down from peak.

Sustain: The sustain time is the duraiton when the sound is in sustain level.

Release: The release time is the duration when sound run down to zero after the key is released.

3.2 The Feature Summary of *Q-MIDI*

1. Up to 8 notes can be played simultaneously on 8 Channels, one note at a time on each channel.
2. Support 128 instruments and 96 percussions.
3. Support 16-level Channel Volume.
4. Support 128-level Velocity.
5. Support Patch Change.
6. Support Pitch Wheel with +/- 12 semitones.
7. Support Tempo ranging from 8 to 250 and Tempo Change.
8. Support Marker Insertion.

3.3 Cross table of Percussion and Keyboard Pitch

Percussion vs. Keyboard Pitch					
Percussion No.	***Keyboard Pitch***	***Percussion Name***	***Percussion No.***	***Keyboard Pitch***	***Percussion Name***
024	C1	--	055	G3	Splash Cymbal
025	C#1	--	056	G#3	Cowbell
026	D1	--	057	A3	Crash Cymbal 2
027	D#1	High Q	058	A#3	Vibraslap
028	E1	Slap	059	B3	Ride Cymbal 2
029	F1	Scratch (Push)	060	C4	Hi Bongo
030	F#1	Scratch (Pull)	061	C#4	Low Bongo
031	G1	Sticks	062	D4	Mute Hi Conga
032	G#1	Square (Click)	063	D#4	Open Hi Conga
033	A1	Metronome (Click)	064	E4	Low Conga
034	A#1	Metronome (Bell)	065	F4	High Timbale
035	B1	Acoustic Bass Drum	066	F#4	Low Timbale
036	C2	Bass Drum 1	067	G4	High Agogo
037	C#2	Side Stick	068	G#4	Low Agogo
038	D2	Acoustic Snare	069	A4	Cabasa
039	D#2	Hand Clap	070	A#4	Maracas
040	E2	Electric Snare	071	B4	Short Whistle
041	F2	Low Floor Tom	072	C5	Long Whistle
042	F#2	Closed Hi_Hat	073	C#5	Short Guiro
043	G2	High Floor Tom	074	D5	Long Guiro
044	G#2	Pedal Hi_Hat	075	D#5	Claves
045	A2	Low Tom	076	E5	High Wood Block
046	A#2	Open Hi_Hat	077	F5	Low Wood Block
047	B2	Low Mid_Tom	078	F#5	Mute Cuica
048	C3	High Mid_Tom	079	G5	Open Cuica
049	C#3	Crash Cymbal 1	080	G#5	Mute Triangle
050	D3	High Tom	081	A5	Open Triangle
051	D#3	Ride Cymbal 1	082	A#5	Shaker
052	E3	Chinese Cymbal	083	B5	Jingle Bell
053	F3	Ride Bell	084	C6	Belltree
054	F#3	Tambourine	085	C#6	Castanets

Percussion vs. Keyboard Pitch					
Percussion No.	Keyboard Pitch	Percussion Name	Percussion No.	Keyboard Pitch	Percussion Name
086	D6	Mute Surdo	089	F6	--
087	D#6	Open Surdo	090	F#6	--
088	E6	--	091	G6	--

3.4 NY7 Development Flowchart